

34.5:35.3 = 33.2: X

Mancallinae

Mancallinae *affluent*

Mancallinae *lower level?*

A coracoid $\frac{V 68106}{88614}$

and a scapula $\frac{V 68145}{95119}$

represent *Am's* extinct *subfamily* of flightless *auks*

distance from scapular facet to sternal end

Ratio of depth through scapular facet to shaft below scapular facet

88614 34.4 (eroded)

5.2 mm 15.90 6.8

19.8%

6.9

M. calif (Crematophan)

6.1

M. cedronensis

type 31.6

5.2

5.2

16.4%

7.0

22.1%

15410 33.2

5.8

5.25

15.8

7.1

21.4

15400 33.97

X

5.4

15.9

7.1

20.9

M. diegense

2422 35.0

5.24

14.8%

7.0

20.0%

2844 35.7

5.25

14.7

6.75

18.7

2290 35.0

5.0

14.3

—

—

2087 34.5

4.9

14.1

6.5

18.8

2067 36.8

5.1

13.8

7.0

19.1

2184 36.4

5.2

14.2

6.3

17.3

2310 35.8

5.9

5.4

15.1

7.1

19.8

7) 2492 35.6

7) 360 5.1

6) 406 6.7

M. calif is ruled out on the basis of the fact that the anterior border of the furrowed canal forms the anterior border of the shaft below its furcular facet, whereas in *M. calif* the furrowed canal border is slightly posteriad. (see Howard 1970: 4)

breadth of proximal is equalled in both *Cediz* & *diegense* but shaft is narrower than in either.

[NOTE: Where is 14.4 mm in specimen of *diegense*? FOUND, LHM #2345]

Scapula	br. prox	br. sh lower	depth sh
V 68145	14.0	6.7	3.35
95119 LHM #2345	14.4	7.7 mm	3.3
15410	13.5	6.35	3.0
15410?	14.2	6.45	3.1
diegense	12.4	6.4 mm	2.6
V 45860	13.4	6.2	3.0

depth sh 3.6 mm in sh 7.7 (occurs at same place 7.7, 3.35)

OVER

Mauicalla^{cf} *diegensis* apronly measured
*Q*_m ^{incomplete, eroded} (coracoid #88614 (loc. V 68106) and scapula #95119

(loc. V 68145) can be assigned to the genus, Mauicalla.
M. milleri is immediately ruled out on the basis of its small size.
Though eroded, the area through the humeral canal is
well enough preserved to show that the anterior border of
the canal coincides with the anterior border of the shaft
as in *M. diegensis* and *M. cedrosensis* as distinguished
from *M. californicus* (see Howard 1950:4). In proportions
the bone agrees with *M. diegensis*; the coracoid of *M.*
cedrosensis is shorter & stouter (Howard 1971: 11 and 15).
The scapula is very large and equals a scapula ^{in the AMNH} #2345
assigned to *M. diegensis*.

San Mateo VCM
Scapula 95119, Loc. VCM P 68145 Z L Hcm V299
Contour eroded but appears to resemble *P. (lag.)* in contour
& *Mauicalla* in flatter ventral surface. It is suggested
also that the ~~acromion~~ dorsal area adjacent to the
acromion is more depressed for greater distance distally
than in *Mauicalla*. This area is incomp. in *P. lag.*

Cedar Island or San Diego
Mauicella Humeus

added May 1969
from 1968 notes

Cedar	Pr. pux	Distance head to below int. tub.	ap Br force	Distance median edge (ant) int. tub. to head	Distance top of fossa to dist edge bicip. surface	Depth head	ht head	Prox- dist thru int. tub.	Depth Bicip. sub to top int. tub.	Br triceps depth	Length to int condyle							
65145 15367	18.6	11.8	4.8	10.3	8.4	7.45	6.3	3.3	9.4	5.6	72.7							
65151 15382	20.2	11.9	5.25	11.4	9.3	8.3	7.1		10.4	7.7								
65145 15368	17.0?	11.1	4.8	10.3	—	6.45	6.1	3.4										
65133 15408	19.9	13.4	4.8	11.0	8.4	8.2	6.9			6.9								
65153 15388	12.9	11.6	—	10.3	—	7.7	—											
65153 153	93.6 15.6 170-20.4																	
15373	17.9										72.4							
65115	18.6																	
65115	18.6																	
65115	18.6																	
San Diego																		
1071 2331	18.7	13.3	4.9	12.3	6.8	8.2	7.25	15.3	10.3									
1071 2331	19.8	11.5	5.2	11.2	7.9	8.3	6.7		10.2									
1071 2219	15.25	9.7	4.25	9.3	5.3	6.4	5.1											
1080 2301	18.45	11.8	4.4	10.9	6.3	7.2	6.5											
18.1-2	17.0																	
14.0-15.0																		

93.6
17.9
11.5
19.1
6.5
3.4
7.0

may 1969 - copied from previous charts
 humus large only

$$\begin{array}{r} 6901 \\ - 852 \\ \hline 81059 \end{array} (75.7 = \text{Mod})$$

	Length to int cond	Length to deltoid crest	Br max	Br. dist	HT at epi- cond conc.	Br sh	Depth sh			Length (center cond)	Br max at epi- cond	Depth max	Depth at dist cond	Br sh middle	Depth sh middle	on length ★			
San Diego R 2620	85.2	57.0	(20.3)	8.0	19.8+	5.2	10.5		Squ B 2064	32.0 33.0	6.4	10?	7.8	3.9	6.8	33.0			
R 2304	78.7	52.0	(18.2)	7.0	16.8				no #	30.1	6.3	9.8		3.4	6.3	30.8			
Typh X L 2480	—	51.9	19.7	—	—	4.9	11.5		2323	28.8	6.6	10.2		3.8	6.3	29.4			
L 2480	74.4	49.7	18.7	6.5	17.3	4.4	8.7		45859	28.3	6.1	9.8		(3.5)	5.2?	28.7			
L 182	73.5	48.7	18.2	—	—	?	?		2287	27.9+	6.2+	—		3.4	5.8	28.5			
R 7731	80.4	54.8	18.6	—	—	—	—		2248	—	6.5	10.0		(3.9)	6.3	—			
X 2207	79.4	53.7	18.9						5147.1 29.4	5130.1 6.3	5149.8 9.9					5150.6 30.1			
L 2495	72.2	47.6	18.2	6.9	16.4	4.3	8.7												
HT	70.9	48.7	18.4	6.8	15.8	4.1	8.4		Cedron 15272	31.8	6.9	9.9	7.1	4.1	6.1	32.3			
UC 12 2445/2008	—	—	19.0						15398	31.6	6.7	10.0	7.1	(6.2)	6.2	32.5			
2448	—	—	19.3						15414	(31.9)	(7.2)	9.7	7.8	(4.2)	(6.9)	31.2			
R 2331	—	52.83	19.8	—	—	—	—		15355	31.0	6.7	—	7.55	4.1	6.1	31.8			
9) 6969	76.6		18.9						15371	30.7	(7.5)	(10.3)	(8.1)	3.9	6.5	31.3			
15373	72.4	—	17.9	2.5		4.5	11.0		15394	30.3	6.6	—	7.1	4.0	6.0	30.9			
Cedron	70.7	—	18.6	2.0		4.5	11.5		15424	30.0	6.55	—	7.1	(3.8)	6.2	30.6			
15367	—	—	17.0?						15399	29.5	—	9.8	7.2	(3.8)	6.5?	30.4			
15368	—	—	18.0						15415	29.5	6.5?	9.2?	7.5	4.2	6.6	29.8			
15404	—	—	19.9						15373	29.5	6.5	9.5	7.3	4.2	6.2	29.7			
15388	—	—	17.9						15394	28.6	(6.2)	10.1	7.5	4.2	6.7	29.2			
15342	—	—	20.2						15412	(28.5)	6.4	(8.9)	(6.4)	(3.9)	(5.8)	28.7			
		6) 1115							12362.9	173.2	87.4					36.4			
		18.6							30.2	6.4	9.7					30.7			

- = checked to 1947-1960 list

10.6.60

Arranged in order of size

1st by overall length
then by length thru deltoid

11.7 prox breadth

Humerus

PR as of March 1964 (new list)

Maulsby
Lumeni San Diego

333 length meas
6 additional into deltoid length meas

R	Length int cond.	Br prox end	Br dist end	Length thru deltoid	Depth deltoid crest	Ht scapula condyl	Ratio length deltoid to int cond.	1969	Length thru int cond.	Br prox end	Br dist end	Length thru deltoid	Depth deltoid	Ht scapula condyl	Ratio length deltoid to int cond.
2470	85.2	20.3	8.2	57.0	12.4	19.8	✓ 67.2	✓	2427	15.8	6.2	43.7	9.4	13.2	✓ 69.3
L 45858	—	18.3	—	—	—	—	✓	✓	L 2343	15.6	6.0	43.6	—	13.2	✓ 69.0
2207	—	18.9	—	53.7	10.4	—	✓	—	2292	15.0	6.0	43.6	—	13.2	✓ 69.0
L 2331	—	19.6	—	—	—	—	✓	—	UCMPL 45850	15.3	5.7	41.6	8.7	12.4	✓ 66.4
L 2658	—	19.2	—	—	—	—	✓	—	45845	15.2	5.7	41.6	8.7	12.4	✓ 66.4
R 2304	78.7	18.2	6.8	52.0	10.3	16.8	✓ 66.0	—	L 2303	15.4	6.1	42.1	9.0	13.5	✓ 67.2
R 2355	76.2	18.2	6.8	52.8	10.3	16.8	✓ 66.0	—	R 2442	15.4	6.1	42.1	9.0	13.5	✓ 67.2
L 2270	74.6	18.7	6.5	49.7	10.3	16.5	✓ 66.5	—	L 2480	14.8	5.7	43.2	8.6	13.4	✓ 67.2
R 2480	73.5	18.2	6.5	48.7	10.6	16.4	✓ 66.3	—	L 2214	14.8	6.1	41.8	9.4	12.6	✓ 67.2
R 2695	72.2	18.2	7.0	46.6	10.7	16.4	✓ 64.5	—	UCMPL 45842	15.1	5.1	41.3	9.8	13.5	✓ 67.2
L 2498	71.0	18.4	6.7	48.7	10.3	16.4	✓ 67.2	—	R 2818	15.6	6.2	40.8	9.6	14.2	✓ 67.2
R 2066	70.2	17.3	6.7	48.7	10.3	16.4	✓ 67.2	—	R 2318	14.9	5.5	42.2	8.3	13.2	✓ 69.2
L 2892	—	16.3	—	—	9.0	—	—	March 1964	UCMPL 45842	14.4	—	—	—	—	—
R 2481	—	16.4	—	45.3	9.9	—	—	—	R 2077	15.2	—	42.4	8.3	—	—
L 2505	—	16.2	—	—	—	—	—	—	L 2280	15.0	—	—	—	—	—
R 2281	66.6	—	6.0	44.0	—	13.8	✓ 65.7	—	L 2206	14.6	—	42.4	9.0	—	—
L 2480	66.1	15.6	5.8	45.3	9.7	15.2	✓ 66.9	—	L 2537	15.0	—	42.4	9.0	—	—
L 2480	66.1	15.5	6.0	44.3	8.5	15.2	✓ 66.9	—	L 2505	16.2	5.3	41.3	—	13.0	✓ 67.2
L 2480	65.1	15.1	6.1	—	—	13.2	✓ 67.2	—	L 2206	15.0	—	42.4	9.0	—	—
R 2218	65.0	15.7	6.1	43.7	—	13.7	✓ 67.2	—	L 2206	15.0	—	42.4	9.0	—	—
L 2326	63.8	14.2	—	44.1	9.3	—	✓ 69.2	—	L 2206	15.0	—	42.4	9.0	—	—
L 2046	63.7	15.5	6.2	42.0	9.8	13.3	✓ 65.9	—	L 2206	15.0	—	42.4	9.0	—	—
L 2553	63.4	15.3	6.0	43.3	9.1	14.1	✓ 67.9	—	L 2206	15.0	—	42.4	9.0	—	—
R 2504	63.3	14.6	5.3	43.0	—	—	—	—	L 2206	15.0	—	42.4	9.0	—	—
R 2538	63.2	15.1	5.5	44.7	9.2	13.0	✓ 70.7	—	L 2206	15.0	—	42.4	9.0	—	—
L 2502	—	15.0	—	44.3	9.3	—	—	March 1964	L 2206	15.0	—	42.4	9.0	—	—

This list checked to former list and used to get coefficients (but did not include 1969)

See earlier lists for complete prox end.

Range 85.2 - 56.4 gr. length
57.0 - 38.7 length to deltoid
20.3 - 14.2 Br. prox
8.2 - 5.2 Br. dist
19.8 - 10.9 Ht scapula

Mancalla ~~cf.~~ diegense

Ampl
An incomplete coracoid (88614) from locality V68106, and a proximal end of a scapula ^(Craunmancalla) (95119) from locality V68145, both badly eroded, represent the extinct genus of flightless auks, Mancalla. Four species of Mancalla have been recorded from the west coast, all Pliocene in age: M. milleri and M. diegense from the San Diego Formation (late? Pliocene), M. californiensis from the Repetto Formation (middle Pliocene), and M. cedrosensis from the Almejas Formation ^(mid Plio?) of Baja California. Assignment of the Oceanside material to M. milleri is immediately ruled out on the basis of the *much* small size of M. milleri. Distinction from M. californiensis is evident in the coracoid in which the anterior border of the triosseal canal conforms to the anterior border of the shaft ^{as in M. diegensis} / (in M. californiensis, the border of the triosseal canal is inset from the shaft border). Distinction from M. cedrosensis is based on greater length of the ^{coracoid} element and its more slender proportions. Even in its poorly preserved state, the Oceanside coracoid is ^{longer (meas from scap (or dist end))} shorter than any of the three available coracoids of M. cedrosensis, but comes within the *breadth of shaft & depth thru triosseal canal also conforms to M. diegense.* size range of M. diegense. The scapula is very broad across the proximal end and has a very heavy shaft. It ~~can, however, be~~ matched by one ^{San Diego} specimen ~~of M. diegense~~ in the Loye Miller collection at UCLA (no. 2345), assigned to M. diegense.

11.6.68

Humerus Maucalla

59.3
59.4

Cedros y Ciénaga del Mar

Carpometacarpus

Cedros Id	Length to condyle	Bx prox	Bx dist	Scant Bx sh (mm)	Gr depth sh	distance and crest to dist papilla	Bx. at lead dist papilla	Dist ext cond to top papilla	Site C Mata	33.4? Bx 33.4? Carp meta carpus	Depth Tunn M1 T nit ant	Length prox M1
65147									Cedros Id			
15373	72.1	17.8	7.15	4.5	11.0	8.5?	5.2	12.5	65153	34.8	10.5	15.4
65145									15392			
15363	72.1	18.5	7.0	4.5	11.5	9.2	4.6	12.5	65153	36.0	10.2	15.7
65153									15391			
15388	—	17.8	—	—	—	—	—	—	65147	35.7	—	15.4?
65153									15373			
15389	—	17.0	—	—	—	—	—	—	Ciénaga del Mar			
65151									2033	—	11.6	17.6 ✓
15382	—	20.3	—	—	—	9.	—	—	2578	41.3	11.0	17.6 ✓
Ciénaga del Mar												
2575	—	18.5	—	3.9	13.1	9.5	5.1	12.5	2553	—	11.3	16.5 ✓
Laguna de los 65120	—	—	7.1	—	—	—	—	—	San Diego			
									2060	35.9	9.7	15.0
									2549	35.5	11.2	15.4
									2541	37.2	11.0	15.2
									2048	39.6	8.8	12.5
									45861	35.3	10.5	15.1

$$\begin{array}{r} 7.45 \\ 8.05 \\ \hline 15.50 \end{array}$$

gloria form called by Shelley 4.26.63
 tiny gray ceratoid (small bird sp?)
 pink and worn tapers - Puffins or skuas!
 206597 Corshew Hall m. Sta. Rosalia
 mid Plio. Baja Calif, Mex.

15370	36.7	15.7	11.1	4.8	3.7	4.7	78.6%	139.1	46.5	50.3	7.9	100.7%	65150	7.4	5.9	—	6.0	45.1	46.6
15410	35.4	15.5	11.1	4.8	3.7	4.7	78.6%	139.1	46.5	50.3	7.9	100.7%	15410P	7.4	5.9	—	6.0	45.1	46.6
15433	35.8	16.0	10.2	4.6	3.4	4.3	79.1	156.6	44.6	51.3	8.2	98.7%	15410L	7.4	5.75	5.5?	—	45.1	46.6
15392	35.0	17.3	10.4	4.6	3.5	4.6	76.1	146.5	43.7	52.2	8.0	93.7%	15373R	7.0	5.1	16.3	5.3	43.2	45.2
15370	35.0	15.5	—	—	3.45	4.3	80.2	—	44.3	53.6	8.2	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.6
15384	35.8	15.4	—	—	—	—	—	—	—	49.0	7.5	109.2%	15373	7.3	5.6	—	5.7	45.1	46.

The Cedrus Id. caespit' seem to have no distinction from the large ones of San Diego.

11.6.68

Three

29.8-33.0

25.3 - 27.7

65120 F65

29.7 - 30.5

2.6. 2001

Ornucalla Utina

	a	b	c	Dist inter cotylae lips through olecranon	Leath by sh	Depth sh ← olecranon as	Ratio b/a	da Ratio da	ef	fa	Depth to int cotylae & condyle							
1067																		
2580	9.8	5.3	6.6	7.0	3.8	6.4	54.2	71.4	58.5	65.3								
1079	8.9	5.2	6.3	6.8	3.3	6.0	50.6	78.2	—	—	29.7							
2248	9.1	4.8	6.6	7.1	—	—	50.6	78.2	—	—	25.9							
2323	9.3	5.0	6.6	7.3	3.7	6.2	53.7	78.6	59.7	66.7	29.7							
2284											25.9							
2044											25.0							
2497	7.95	4.24	5.7	6.25	3.2	5.1	53.4	78.5	62.9	64.2	29.5							
2982	8.6	4.2	5.5	6.2	3.0	4.9	54.3	81.5	61.3	64.5	27.2							
1080	8.0	4.2	5.4	6.0	3.25	5.4	52.5	75.0	60.3	67.4	23.9							
2439											23.9							
2452	7.55	—	5.55	—	3.2	5.4		78.5	59.3	71.5	23.9							
2497	7.8	4.3	5.7	6.2	3.2	5.2	54.2	79.4	59.3	66.7	26.3							
4515	10.2	5.0	6.9	8.4	3.9	5.6	49.0	82.3	62.9	60.7	25.2							
15371											27.4							
65149	9.5	4.9	6.95	7.9	4.0	5.7	51.4	83.3	70.3	60.0	28.2							
15372											26.1							
65153	9.8	4.7	6.2	7.8	4.1	6.45	57.9	79.4	63.5	65.7	32.5							
15394											28.2							
65153	9.8	5.0	6.7	7.5	3.9	5.8	51.0	85.6	67.3	59.3	28.2							
15398											26.8							
65144											25.9							
15424											29.7							
Saguma											25.6							
1154 (sp)	9.2	5.2	6.6	7.2	4.2	6.1	57.2	79.1	68.7	67.1	30.6							
1154	9.1	5.3	6.35	7.1	3.9	6.1	58.3	78.1	64.0	67.1	26.4							
1154	9.3	5.0	6.0	7.8	3.7	5.7	53.7	79.4	64.7	—	30.4							
113A	8.1	4.2	5.4	6.0	3.4	4.9					24.0							
1120A	7.7	4.3	5.5	—	3.2	4.95					23.3							
113	8.57	5.0	6.45	—	4.0	6.3					27.0							
1120A	8.4	4.6	6.4	—	3.8	6.1					—							

Utina from Corna del Mar Pas least prominent olecranon (least bulbous at tip, least projecting & least curved-intelligible)

Two small ones but now clear.

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D. albatrus

D. albatrus

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anglica

from Lankut

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Alcidae
+ type

Vigors 1825, Transactions of the Linnean Society London.
vol. 14, p. 498

Charadriiformes
+ Al?

Huxley 1867, Proceedings of the Zoological Society of London p. 343

slide 1855. also + orda

both (11 75 Brachycephalus marmoratus
" 11 76 " " " also

slide (11 32 Eudomyphura craveni
(379 " " " hypoleuca # doesn't swim

slide 528 Pterochaetopterus cheilicus straight shaft-

slide 1732 Synthlibraeus antiquus

1173 Cephelus columba

697 U. aalge

slide 696 Lunda cirrhata

MVZ 61001 Aethia pusilla

slide 60629 " pygmaea

slide 89469 Cyclophryne fuscicula

slide 524 Aethia

fossil

107032

2.3 x 2.7

sh.

3.1 x 3.9

= 7.9%

3.8 x 4.8

= 8.0%

a humerus LACM 107032 resembles modern sp. of the genus Cephelus or the same, in ^{transverse} section

Broadly rounded shaft which is ^{rather compressed or blade-like} S curved, as viewed both laterally and anteriorly. I find this combination of characters in no other modern genus. Though Uria ^{is a bit more} the lateral S curve & the shaft is blade-like, not rounded. Shaft straight in Cyclophryne, Lunda, Liabirula, Aethia, Pterochaetopterus. Other genera are either straighter Lunda, Liabirula, Cyclophryne, Aethia, Pterochaetopterus.

or much more blade like in shaft also, Uria, Eudomyphura, Brachycephalus, Synthlibraeus.

Genus Cephelus

That of the quill-like (Ceph.)

A humerus, LACM 107032 resembles modern species of the genus Cephelus as distinguished from the genus of the same name. It has a broadly rounded (rather than compressed or blade-like) shaft which describes an broad S curvature from proximal to distal end as viewed both laterally and anteriorly. I find this combination of characters in no other genus.

4.8 / 3.87
3.9 / 3.10
2.73
3.70

2.75 / 2.30
2.70

33 mm
LACM col.
3820 4100
br. like but
15 h. pyg

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	61	71	61.6	1174	1173	1172
	C. grylle			48.7	678	46.2
Greatest length	59.8-60.6					
Br. prox across bicipital crest	14.4-14.0					
Breadth dist condyles	6.9-7.0					
<i>Least shaft diameter</i> Breadth of shaft (middle)	3.4 3.9	3.8				3.2
<i>greater</i> Depth of shaft (middle)	4.4 4.3	4.8				5.2
Ratio of breadth to depth of shaft	77.2 81.3	79.16				
Ratio of breadth to length of ipectoral attachment		54.99				
Length feet attach.	8.1 8.6	7.3	8.71 9.3 9.5			
br feet attach (middle)		4.0				
ratio length feet to br. length base	13.5% 14.4%	11.52	12.66 13.71 14.35			
head bicipital edge sub	13.7 13.6	14.3	14.8 14.2 14.3			
hiap surface						
gr. br. bicip crest to feet attach	14.5 14.0	15.24	15.0 15.1 14.9			
ratio	94.4 92.17	94.20	98.4 94.0 95.97			
gr. br. prox bicip to	24.0 23.10	25.00	21.83 22.27 22.5			
br dist end through condyles	7.2 7.1	7.1	8.0 7.9 7.5			
ratio	11.7 11.7	11.52	11.6 11.65 11.3			

Shorter

and bordered by acute

Concave

^

shown ~~concave~~ ~~defined~~ with
with surface concave ~~concave~~ ~~defined~~ ~~with~~
shaft medially ^{sub} acutely ridged

universe. It does not lead us to take the step of fashioning a godlike being in our own image." Morality he saw as "a purely human matter, albeit the most important in the human sphere." Elsewhere he spoke of his high regard for such personalities as Buddha, Moses and Jesus: "What these blessed men have given us we must guard. . . if humanity is not to lose its dignity, the security of its existence and its joy of living."

Many letters came to him from complete strangers. He often answered in considerable detail--especially those from children and from students seeking guidance. His correspondence with friends sometimes included ap~~pro~~risms and rhymes. Among those receiving such offerings was Queen Elizabeth of Belgium, whom he addressed quite simply as "Dear Queen."

His interest in music, his thoughts on Zionism, his devotion to and quest for peace, are all covered in letters or notes.

Many of the entries were, of course, originally written in German. Referral to the German originals provided in the last 30 pages, shows clearly how faithfully these were followed in preparing the English translations presented throughout the text.

There is no attempt at chronological sequence in the book. But a brief chronology is added as a postscript. One wishes that this might have appeared as a preface. For, upon reading it, the events noted throughout the book fall more clearly into place. But this is a minor criticism of a thoroughly pleasing, thought-provoking work.

C. Olson's 107032

C. gyllis 18071 34474

C. calata 12 12

C. calata 12 12

C. calata

	107032	18071	34474	12	12	12	12	12
XX g. length	61.6	60.6	59.8	66.2	68.8	73.0	74.5	65.4
a br sh	3.75	3.4	3.5	3.3	3.5	4.0	4.8	3.2
b depth sh	4.8	4.3	4.5	4.4	5.0	4.6	5.3	5.2
dist br.	9.3	8.6	8.7	9.5	9.6	10.0	10.4	9.5
diag								
br condyle	7.1	7.1	7.3	7.4	7.8	8.4	8.7	7.5
int ectep cond. pr.	8.4	8.0	8.3	8.7	9.2	9.2	9.4	7.8
X ratio ab	77.08	79.06	81.39	71.73	74.0	76.0	78.54	61.53
Shap								
X ratio	6.0	5.6	5.0	4.9	5.3	5.4	5.7	4.8
an x								
X ratio	7.79	7.08	6.4	6.9	7.2	6.3	7.3	7.9
8 x								
X ratio	15.4	14.1	14.45	14.8	15.0	15.9	17.5	13.9
br g.								
X ratio	25.0	23.26	24.24	22.35	21.8	21.7	23.4	20.9
br								
X ratio	11.68	11.69	12.0	11.1	11.3	11.5	11.67	11.44
br								
X ratio	7.6	8.0	8.3	9.2	8.4	10.6	10.3	9.3
br								
X ratio	3.7	3.0	3.8	3.5	3.9	3.6	4.0	3.8
br								
X ratio	50.0	41.6	45.6	38.0	45.9	37.7	43.6	40.8
br								
X ratio	17.0	15.6						
br								
X ratio	14.3	13.85	13.5	14.4	14.8	15.6	16.8	
br								
X ratio	92.25	98.22	93.75	97.29	98.66	98.11	95.45	
br								
X ratio	6.0	5.6	5.8	4.9	5.3	5.4	5.7	4.8
br								
X ratio	7.79	7.0	7.5	6.9	7.2	6.3	7.3	7.9

shaft 90
60% in
microfilm

Shaft medially, posterior attachment

Shaft shaples, notched adjacent
to peduncle attachment
of C. gyllis but space between this
ridge & midline not narrow & undepressed

5.8 7.0 depth dist

TABLE III

Measurements (in ~~millimeters~~^{mm}) of Oceanside Praemancalla^{specimens?} bones* and those of P. wetmorei, P. lagunensis and Mancalla diegensis (maximum)

	Oceanside <u>Praemancalla</u>	<u>P. wetmorei</u>	<u>P. lagunensis</u>	<u>M. diegensis</u>
Humerus				
Length to intercondylar sulcus	80.8	81.1	----	83.4
Proximal breadth	20.5	22.2	----	20.3
Greatest depth of shaft	9.8	9.6	7.7	10.3
Breadth shaft (same place)	5.2	5.1	5.1	5.2
Ulna				
Length to intercotylar ridge	36.7	----	----	32.0
Proximal breadth	7.5	7.5	----	6.6
Proximal depth	11.0	11.3	----	9.3
Breadth shaft (middle)	4.4	4.2	----	3.9
Depth shaft (middle)	4.6	4.2	----	6.8
Carpometacarpus				
Length	36.3	36.3(est)	----	37.2
Breadth proximal trochlea	5.2	5.3	5.2	4.7
Depth prox. end thru M 1	11.8	12.1	11.7	11.0
Length process of M 1	15.2	15.7	14.0	15.5
Breadth of shaft	4.0	4.0	4.5	3.7
Libiotarsus				
Length to proximal articular surface	105.1	----	----	98.5
Distal breadth	13.5	----	----	10.7
Distal depth	12.1	----	----	9.7
Pharsometatarsus				
Greatest length	47.5	----	----	43.6
Proximal breadth	12.1	----	----	10.7
Distal breadth	11.6	----	----	9.4
Shaft breadth (middle)	6.1	----	----	5.4

*Humerus LACM 107029, all others LACM 107028.
Femur SDSNH 21101

Femur				
Greatest length(external)	69.3	----	----	57.0
Distal breadth	14.4	----	----	11.1
Proximal breadth	14.6	----	----	11.7

Early Miocene
21-23 ^{million} years

Seewett sand, Pyramid Hill, "woody local fauna"
Molluscan = Vaguenz Stage
Forams = Upper Zemonian or Sausseian Stage
land mammals = Arukarean

Early middle Miocene

Olcere sand overlain by Round Mountain silt
(Kern River district)
Molluscan - "Tumbler Stage"
Forams = Upper Sausseian, or Relizian Stage
land mammals few - Possibly Hemmingfordian
Includes Barker's Ranch Fauna (invertebrates)
2 Marine Vertebrates ^(odontocetes) resemble Calvert fm, Maryland.
Astoria fm, Oregon correlates with Barker's Ranch fauna

Middle Miocene

13-15 my ~~BP~~

Sharktooth Hill Boned - Round Mountain silt
Boned both above & below mollusk bearing "Tumbler"
Boned underlain by Relizian and/or Lusitanian forams.
land mammals - Barendorian
Cetacea - grade of evol. agrees with Calvert fm.
of Atlantic coast

Late Miocene

10-12 my ~~BP~~

Includes in So. Calif.:

Formations: Santa Margarita

both marine & terrestrial vertebrates {
upper San Pablo
Monterey
Towsley
Modelo
Sisquoc
Valmonte diatomite (of Monterey fm)

Correlation with Margaritan Stage

Mohnian & Belmontian (forams stage)

Clarendonian ^{age} (land vertebrates)

Latest Miocene to
Earliest Pliocene

OVER

Lateest miocene to
Earliest Pliocene

10-5 my BP

Drakes Bay formation (north of San Francisco)

Purisima formation - central Calif. coast

Capistrano formation - Orange County

San Mateo formation - San Diego County

Almejas formation - Pacific Coast of Baja Calif.
and on Isla Cedros, Mexico.

Correlate with Sacalitos + Etchejoan formations
of San Joaquin valley

so correlate with

Molluscan provincial stages

" Sacalitos "

" Etchejoan "

Also correlate (less directly) with

Hemphillian mammal age No. Amer.

Late Delmontian

Repettoian

Venturian

} foram stages

Late Pliocene (Middle to Late)

5-3 my BP

Merced formation central Calif.

Miguel formation Orange County

~~Capistrano formation is related to the~~
~~Capistrano formation~~ related with Capistrano

+ San Diego formation

related to Capistrano fm.

San Diego formation - San Diego Co. +
N.W. Mexico

(Invent. of S.D. fm made middle to
late Plio.)

Vertebates ^{in S.D. fm} younger than ^{upper} Almejas ^{lower}

But ~~older~~ same age as upper Almejas

Therefore younger than Purisima,
Capistrano + Drakes Bay fms.

May correlate with Blancan (mammals,
Whelanian (forams))

San Joaquin provincial (mollusks)

Early Pleistocene

Lomita (no. side Palos Verdes Hills)

Lomita mare is placed thusly:

Pleistocene San Pedro sand

Lomita mare

Pliocene Refetto fm

Late Pleistocene

Palos Verdes sand - San Pedro
Newport Bay ~~etc~~
Ventura

Data obtained from

L. Q. Barnes

An outline of eastern north ~~American~~ ^{Pacific} fossil
cetacean assemblages.

Proc. AIBS Symposium, Systematic Zoology

Cowallis, Oregon Aug. 1975

In Systematic Zool. vol. 25 no. 4

pp 321-343 - Dec 1976

San Mateo
referred to

Vedder - 1972 Review of stratigraphic names
and megafaunal correlation of Pliocene rocks along
the SE margin of the LA Basin in

Stinemeyer et al. Pac. Coast Mica. Biostrati-
graphic Symposium - S E P M ^{Pac. Res.} 1 Bahusfield Calif.

March 1972

155-172

Dr. Jack Vedder
Branch of Paleontology + Stratigraphy
U.S. G.S.
345 Middlefield Road
Menlo Park, Calif. 94025

Call Ed Wilson about insects from San Mateo.

The San Mateo formation has been roughly correlated with several other west coast formations, including The Capistrano formation of Orange County and the Almeyas formation of Ediz Id, Bqⁿ Calif. ^(Barnes 1977) The deposits at the latter locality as well as those from ^{the Capistrano fm in Hills (LACM 45/20 and LACM 45/21)} ~~said to be from~~ ^{the Capistrano fm.} contain numerous specimens typical of the genus Maucaella. ^(Howard 1965 + 1970?) The specimens from the ^{lower} levels of the San Mateo fm, however, are clearly those of the less specialized Præmaucaella ^{known hitherto only from the Monterey fm.} It is suggested, therefore, that the portion of the San Mateo fm from which these bones came more closely correlates with the ^{upper} ~~the~~ Monterey fm than with either the ^{upper} Capistrano or the Almeyas fms.

See Vedder who says (p 167)

"Because the type San Mateo formation of Woodford (1925 p 217 pl 214) near San Onofre may be a channel deposit within the lower part of the Capistrano formation, the name ^[San Mateo] is not used in this report in its original sense."

Vedder

"Review of stratigraphic names & megafaunal correlation of Pliocene rocks along the southeast margin of the Los Angeles Basin, California"

Proc. Pacific Coast Mammal Biogeographic
Symposium Pac. Sect. SEP M. 1972
Bakersfield 1972 p. 147

Mr. Elmer - Marine Div. Shell Oil Co.
Phone 482, 3131

Regarding Age of 3rd St Tunnel:

<u>Repetto, Lower Pliocene</u>	} Possibilities but he agrees <u>Repetto</u> at 3rd St site.
<u>Delmontian Up. Miocene</u>	

The San Diego fm., however, is Late Pliocene

HH observations from literature

San Diego fm. = Late Pliocene (Blancan?)

Cocoma del Mar Loc 1067 = Low Pliocene Repetto

Lompoc = Late Miocene or Low. Plioc. embels

Loc 1945 hesperus wired = Late Miocene - monterey

Tepusquet = Mid. Miocene - Relizian or Malinian

Sharktooth Hill - Mid. Miocene

SDN 4M 2957 = ^{lower} L 4298

? " 2947 = upper
Brockman

68145-

SDN 4M 3004 = ^{lower} L 4299

Ferry
Frazier 3003 = lower
1979

Frazier 3003 lower

Brockman 2947 upper

Larry Har 3004 lower
= 4299.
= 68145-

Frazier 3003 lower
= ?

Brockman 2947

= Frazier 2643? Larry Har

Band shell from 4297 = 68147
SD any?

send Topo
make
Turn Danneré & S.D. low

Bone Valley Early Pliocene Humphreian

Etchequin (early-middle Pliocene) ^{now called} ~~Sabuk~~ ^{Sabuk} ~~Micene~~

SDNHM prepared @ Bob Chandler

~~OK in open Occauido or at OK~~ SDNH,
Dernere

~~Loc SD Mur 3003 Frazier called
Now tie in to Loc 1 UCMR?~~

~~3004 = LAM 4299~~

~~Loc SD Mur 2947 Brockmeier~~

~~2957 ^{you have} = LAM 4298~~

~~3004~~

~~LAM 4299~~

all from white sands
Formation
LACM in
LA
✓
★ 1070
★ LA
★ LA
2 sp? { LA
alcidæ { LA

WACM hor 4297

Imposant

★ 107028

2 L Acm 4298 TUCMP 68144

Praemancalla cf wetmorei

← 2 LACM 4297

4

Praemancalla (?) wetmorei

~~6704~~ 4297

mal end undet. as yet

4297 *Sox*

Alcidae (but does not resemble the three humeri from Lag. Niguel)

UCMP 88614 Nearly complete, ~~xxx~~ (in length) but poorly preserved

Lawrence Canyon 3 1968

Closely resembles *Mancalla diegensis*.

68144, Loretta St. 1 1969

Poorly preserved scapula undet. as yet

UCMP 88656 Complete tarsometatarsus size of G. stellata and G. pacifica

1948

UCMP 88704 Incomplete skeleton of an Alcid (*Uria* or *Lunda*?)

2 ulnae, 2 coracoids, 2 radii, scapula, dist. end carpo.,
pedal phalanx. From UCMP Loc. V68147, Lawrence Canyon

UCMP 88597 Incomplete furcula, undet. from Loc. UCMP V6880.

1968

68144 - UCMP 88640 Pedal phalanx undet. from UCMP Loc. V68144, Loretta st. 1

UCMP 95118 Very slender femur lacking proximal end. Resembles

Chendytes in broad, shallow space between condyles anteriorly.

1970

UCMP 95119 From UCMP Loc. 68145, Loretta St. 2 (1970)

Incomplete coracioid resembling Mancallinae. Seems flatter than Mancalla, may be Praemancalla

UCMP 102428 Axis vertebra -- Laridae or Alcidae. UCMP Loc. V68147,

LA 4298

✓ LAC 4299

 $\angle A \approx 43^\circ$

List of specimens from San Mateo formation, Oceanside
Early Plio? / Late Mio?

UCMP Localities

- Late Middle X 88614 coracoid resembling Mauicella diegensis
NOT Praemauicella Loc V 68106 mid Plio, Laurence Canyon 3 1968
Early X 95119 Scapula Mauicellinae Loc V 68145 Plio? 1970
Early X 88656 Jawia - size as in g. stellata or p. pacifica
presumably, too large for S. bradshawi
from Miguel Loc V 68145 mid Plio, 1968
Loc Sta 2
Early X 88704 Two skeleton Oleidae - Uria or Lunda Loc V 68147
2 ulnae, 2 coracoids, 2 radii, scapula, mid Plio
Laurence Canyon dist end carpalometacarpals, phalanx 1968
X 88646 - scapula sp? Loc V 68144 1969 mid Plio Loc Sta 1
Early X 95118 - Chondytes? one femur very slender Loc V 68145 Plio? 1970 Loc Sta 2
X 88597 - one femur sp? Loc V 6880 mid Plio 1968
Laurence Canyon 1
X 88640 - Pedal phalanx sp? Loc V 68144 mid Plio 1968
Loc Sta 1
Early X 102428 - humerus or Oleidae axis vert. Loc 68147 Plio, 1968
Praemauicella Laurence Canyon 5

- UCMP L ACM Barnes Loc 1253 Laurence Canyon, Oceanside, March 19, 1975
68147 107028 inc. Praemauicella Aethiops
68147 107031 tiny humerus Barnes Loc 1260 March 19, 1975
UCMP 68147 107029 Praemauicella hum. Hammer Loc 226 1975 March 19
68147 107030 Praemauicella coracoid sp Barnes Loc 1260 March 19, 1975
68147 107032 Humerus Oleidae - Laurence Canyon, Oceanside
Barnes Loc 1262, March 19, 1975
Does not correspond to
any of the 3 humeri in the Miguel collection.
Cephus n. sp.

4298 Lawrence Canyon North Early Pleistocene-Hemphillian

33° 12' 35" N 117° 22' 31" W. elev. 100 ft

Township NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 23 T. 11. S. R 5 W

Map Oceauside, Calif 7.5' Topographic USGS 1:25000

Field # MK Hamner 226

Described
by McKenzie

In a small road cut across road, Loretta St, front
north of LSCM #4297

Material: mammalian, Cetacea

Loc. 2 UCMP #68143
Loretta St #1

~~Set~~ March 19, 1975

^{LSCM}
Hemphillian 107029
pedal phalanx? UCMP 25640, 88646

4299 Loretta St. Early Pleistocene-Hemphillian [= Loretta #2 UCMP, 68145]
33° 12' 49" N 117° 22' 35" W elev. 100 ft.
SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 14 T. 11. S. R 5 W

Map Oceauside, Calif. 7.5' topographic USGS 1:25000

In a white sand road cut, .45 miles
north of LSCM 4297 on east side of

Loretta St, north San Luis Rey River

Cetacea, Pisces, Aves.

Loretta St #2 UCMP 68145

Sept 6, 1977

4301 Blancas

stratig above 4297 Sept 8, 1977

orange sand +

conglomerate

"Bisbee" loc

McKenzie field no 50-53

Birds mammal

cetacean

osteichthyes

chondrichthyes

UCMP Gavia #88656

Prunella? few sp. #95118

mid. Scapula #95119

(mammalian?)

= 2

LSCM birds where?

4299

don't have them.

Not found none

4297 Lawrence Canyon

Early Pleist. Hemphillian

Lat. $33^{\circ} 12' 26''$ N

Long. $117^{\circ} 22' 36''$ W

SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 23 T 11 S R 5 W

Map Oceanside, Calif. Quad. 7.5' Topographic USGS 1:25000

Described
by
R. McKelvie

White Sand at foot of SE slope of quarry
situated east of Interstate 5 & south of
7 Road. Colls. made from specimens in
place and float.

See Barnes ^{field no.} 1251-1253, 1260-1263 = UCM P 68147

Sept. 6, 1977

Ordninal. Cetacea, Chondrichthys,
Osteichthys, Aves

Sept. 6, 1977

6 assen. bone	Prameneella	2 ACM	107028
coracoid frag	"	2 ACM	107030
Thudet wing humerus		2 ACM	107031
mech. comp. humerus	Alcedo	2 ACM	102032
asse. wing bone	Uria? n. sp?	UCMP	88704
large vert.	Mancallia?	UCMP	102428
		UCMP Loc	68147

Loc V68145

✓ UCM P 95118 - fur Pradmanacalla?

✓ UCM P 95119 - scapula Pradmanacalla

✓ UCM P 88636 - tarsus Gavia

Loc V68144

✓ UCM P 88644 - scap. poorly preserved ident?

✓ UCM P 88640 - pedal phalanx ident?
probably digit 3

Loc V68147

✓ UCM P 10248² - art is ment. unident?

✓ UCM P 88704 - inc shel. n.sp. alcid

✓ Loc V68106 ~~is it 68146?~~

UCM P 88614 - Coarcted manacalla

Loc V6880?

✓ UCM P 88597 - inc fur ident?

Check This Δ (done - not same digit or phalanx)

pedal phalanx LACM 107028
Ph 1, digit 2

low level
 ucm 88704 Wing bones - 68147 and 4297
 (partial skeleton)
 ucm 102428 Ax & vertebra large (Alcidar?) - Maucaallus 3 ✓ X 68147
 4297
 4297
 4297
 lacm 107028 Six bones (partial skeleton) - Praemaucalla ✓ X 4297
 lacm 67030 frag of scapula end of coracoid - Praemaucalla ✓ X 4297
 lacm 107031 Undet. tiny humerus lacking prox end. ? Aetnia sp. X 4297
 lacm 107032 Nearly complete humerus Alcidar but does not resemble humeri from Sag. Niquel Cephalus X 4880
 88597 → undist. scapula, (across road from 68147 + 4297)

low level
 ucm 68144 and 4298
 ucm 88644 Poor preserved scapula undet X 68144
 ucm 88640 Pedal phalanx undet 4298
 lacm 107029 Inc. humerus of Praemaucalla ✓

level? but probably low based on preservation
 ucm 68145 and 4299 (north of 68147 + 4297)
 88456 Complete tarsometatarsus Gavia over X 68145
 95118 Slender femur lacking prox end undet. try Praemaucalla 68145
 95119 Scamp. scapula - Praemaucalla 68145
 No birds from lacm 4299

Definite higher level
 ucm 68106 and lacm 4301 68106
 88614 - Inc coracoid - Maucaallus X 4301
 unnumbered - 2 prox humeri Maucaallus (one appears to resemble M. cedrorum)
 other Maucaallus bones

Completed after
 discussion of levels
 with Larry
 Aug. 3, 1978

check Gavia coracoid 31417 from Sacm 45121

for size compared to tarsus from uemp 68145.

also new sp. G. badkoberi from Niguel.

check for 3891.

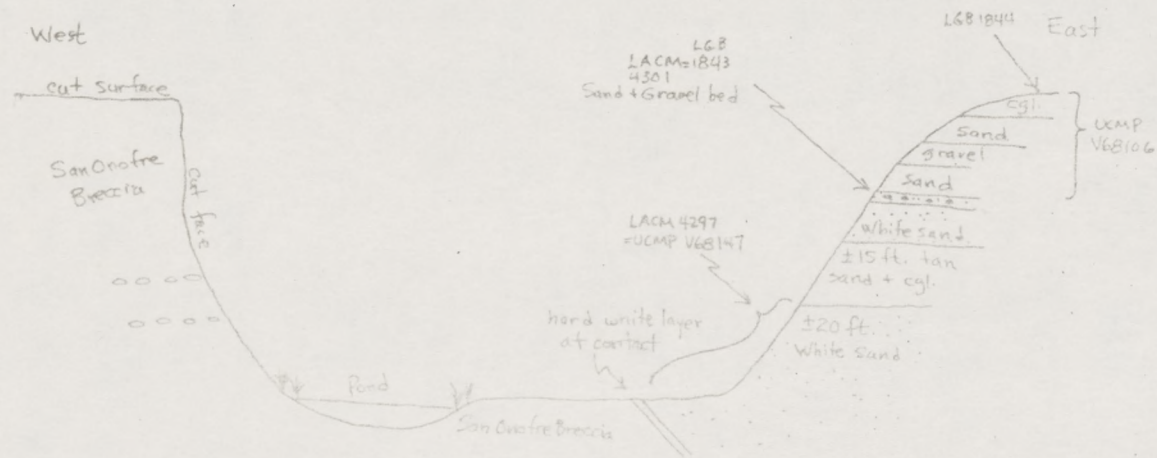
UCMP 88614 from UCMP loc. V 68106 coll'd date?
coracoid is Maucalla Payson July 6, 1978
on

Specimens from LACM 4301 Aug 28, 1977 = 3
Same loc. as UCMP 68106

prox humerus Maucalla
int coracoid (no furc. facet)
dist tibia abraded

23 Specimens from LACM 4301 Feb. 14, 1978 (Barnes 1843)
prox humerus (smaller than the above + broken)
prox scap. (small)
frag shaft (check tibia Maucalla
or radius of larger limb of bird)

Aug 1977 - 3
Feb 1978 - 3
6



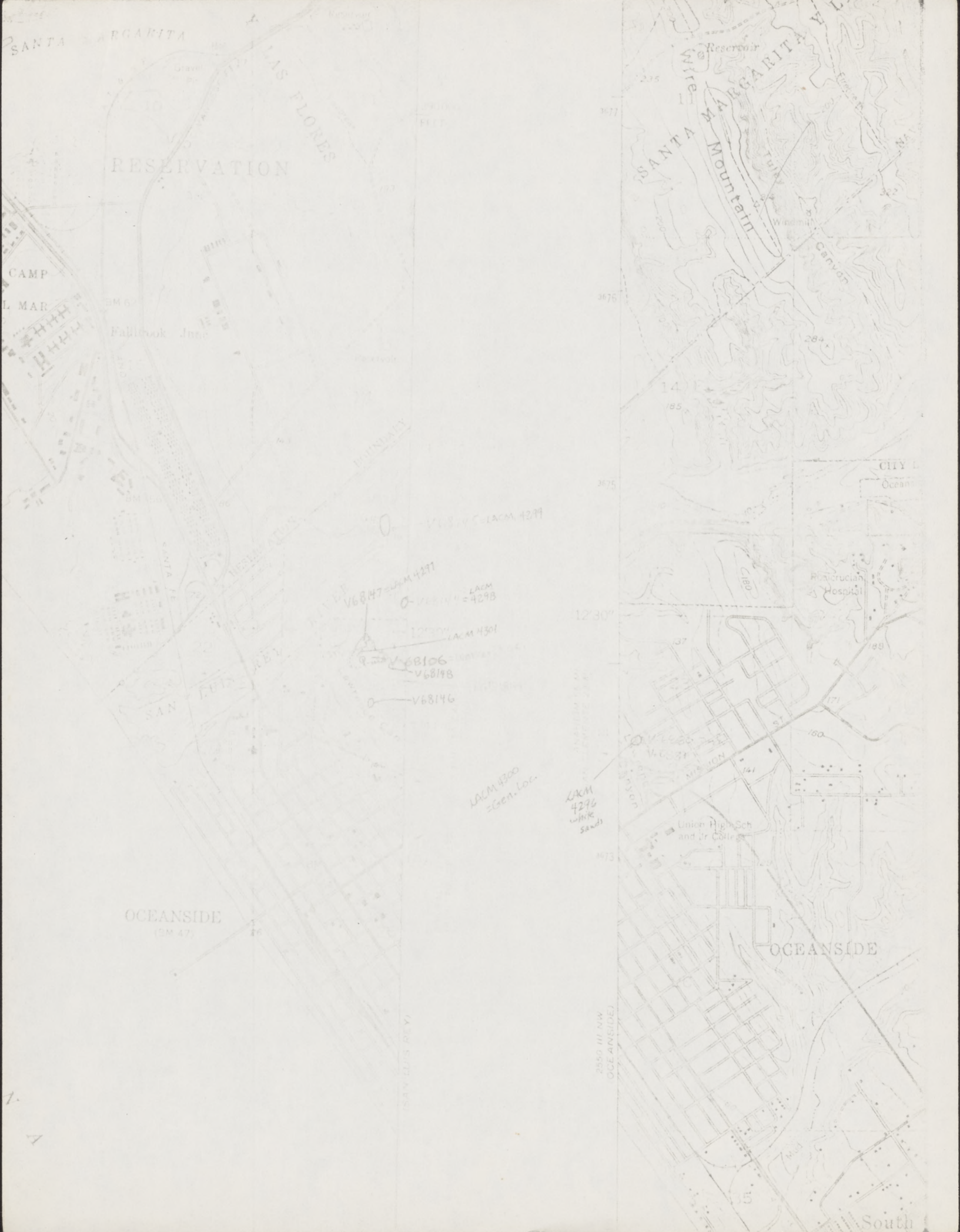
Cross section through Lawrence Canyon quarry, looking North toward Lovetta Street.

L.G. Barnes

14 Feb. 1978

Geologic Notes at Oceanside.

③



Complete
maucallensis

L Tarsometatarsus 119298
| humerus 119165 essentially complete
7 ulna

good prox humerus
119273
119222
119372
119269

good dist humerus
119272 mellei size
119166 with sh. = mellei from same locality
119275

scap prox comp 119269 mellei
" " 119265, 119262 mellei

large ulna 119279 complete L ✓ length 31.5 prox 6.7
appears to have protruded olecranon + deep "dimple" near it
on internal side. Palmar space below cotyloids bordered both
ext + int. by heavy ridge.

good ulna L 119281 ✓ length 28.0 prox 5.7 + Chars as described for 119279
L 119280 " larger than the others = cephalos? 30.7 length 6.0 prox 6.1
and Chars as described for 119279
incl 119282 olecranon missing Area below cotyloids as described for 119279
119287 R ✓
119288 R olecranon 29.1 A prox 6.1 Chars as in 119279
119286 L distal incomplete
119283 L

Total 80

4301. Maucalla

✓ = identified
char. of Maucalla
skn

Jan 22, 1981

① Humeri Complete 19165 ✓

⑧ 8 prox 119253, 119372, 119222, 119269, 119224 (cadherum)
119171, 119268, 119274, 12153 base (undat)

13 dist 119272, 119166, 119167, 119169, 119168, 119407, 119271, 119276
119275, 76, 77, 78
119270

7 30 or shift 119170, 119306
119301, 302, 303, 304 m. hatched
119305 m. dist. end

Ulnae { 119288, 119289, 119279, 119280, 119281, 119282
inc

8 complete { 119283, 119286
1 meleni? 1 meleni?

8 dist. 119284, 119285, 119287

1 prox. 119408

1 palmaroid 119311

OK 13 119265, 119262, 119264
✓ ✓

OK 9 Scap. 119265, 119262, 119264
prox. meleni? meleni? meleni?
119266, 119267, 119261, 119263, 119373, 119172

OK 9 Coracoid 119253, 119254, 119255, 119223, 119256, 119257, 119258, 119259
+ 1 hum. comp mid section Maucalla? 119307

OK 3 carpo. 119290, 119291, 121530
prox meleni? prox

OK 1 - radius prox 119292
meleni?

OK 5 - tars. complete 119298
ceder?
prox meleni? 119297
shift 119299, 119174

dist frag. 119300

1 Humeri
vert. 119252

1 wrist/hand
OZI 119293

OK 6 - Tibia dist 119371, 119295, 119296, 119273
prox 119294
shift 121531 from fib. ent & lig. area

2, pedes dist.
near ok for Maucalla. 119308, 119309

Jan 15, 1979

Lacm 4301 cont'd. No entries on 1st pages.

- INDET SP? 119310 prox end ^{pedal phas.} D1 Ph1 acceptidao sp. Lacm Danilau
- INDET SP? 119312 ^{see below} inc. prox pedal phalax D2 P1? sp? " " "
- Alcedo ^{unmarked} 121532 ^{see below} alced? dist ^{left} tibia near small Lacm post March 9, 1979
- Cora 119307 rt. mid section of cracoid manuculla?
- Tarsus 119300 rt dist frag Tarsus manuculla?
- 2 pedal phat 119308-309 2 pedal phalanges size on fa manucalla
- ulna 119311 Pathological left ulna manucalla (max end swollen & vices injury)
- Hum. 119306 shaft ^{it} manucalla humeri Lacm March 9, 1979
- carpo ^{unmarked} 121530 prox end rt. carpo. manucalla
- 4 humeri 119301, 303, 303, 304- frags near prox end of left humeri manucalla
- 1 humerus 119305 ^{left} frag dist end (shaft near) manucalla
- tibia ^{unmarked} 121531 frag of shaft ^{from phala sent to Lianhua area} dist end fibrotars left Lacm March 9, 1979

To former ^{manucalla} list add

- VI cracoid
- VI tarsus
- VI ulna
- VI humeri
- VI carpo
- VI tibia

✓ 2 pedal phalanges?

To former non-manucalla list add

- Boyle 119310 Indet sp. acceptidao D1 Ph1 prox end
- 119312 " " pedal phas.
- 121532 alceda? dist tibia
- 119260 alceda cracoid (from other sheet)

Loc 4301 LACM partly noted
all other LACM Dandelion
you may find it

39 This page

31+34=65+VCOMP1=66

119165 Complete humerus

prox humeri

Rt 119273, 119372

Bambi
Wetmore
Feb 19, 1978

But shouldn't this be 119272?
119373? NO

[These #s have been checked to specimens -
they are as within and seemingly the
same # received]

left 119222, 119269, 119224 (broken thru the int side +
pneumatic foramen)

6
cedrosensis

LACM
Dandelion

119288 and 119289 - rt ulnae referred (?) to cedrosensis (Complete)
119279, 119280, 119281, 119282 left ulnae referred? " "
31.6 x 7.1 strong (edge of) sharp? 28? prox 6.8? celer?

Mauacalla? milleri

Loc 4301 Larry Dandelion

2 left ulnae 119283 and 119286
int 27.3 to 3.5

dist left humeri 119272 (br. 5.7)

dist rt " 119166 (br. 5.6) LACM March 9, 1979

left prox radii 119265 ident?

119262

119264 br. 11.5 (also 119264 probably
yes)

left prox end carpal 119290 depth prox end 8.9 (miller 8.8-9.5)
rt prox end M1 3.5 (" ?)

prox end radius 119292

? cedrosensis left tarsometatarsus complete 119298

left dist ulnae 119284, 119285 st?

rt " " 119287 st?

prox rt carpo. 119291 br. trichlea 4.5 inc. M1 9.6 depth prox but size on for
either distal or cedros

prox rt ulna inc. 119408

prox rt? tarsus inc. 119297 br. 7.28

Alcidia? Pap end rt coracoid 119260 Larry Dandelion

Not mauacallin

3
mauacalla
sp.

Thrace rest 119252 matches type of cedrosensis
wing phal. 119293 dist 2 phal. 1 mauacalla sp?

st aft tarsus, left 119299 br. 5.1

Genus?
Species

shape of what NO # wing or leg bone O M I T

loc 4301

Jan, 8, 1981

34
This page

Desmuna
maucallii

Walters
Hunt
Aug 28, 1977

28.2?

Too loose for mellei

4 left dist tibia 119371 Br. 8.1, depth 8.1 (no bridge)
" " " 119295 " 8.1 " 8.1 " "
rt " " 119296 " Br. ? depth 8.1 (no bridge)
prox rt " 119294 Br. sh 6.0, depth 4.5 (thin fibular end)

2 cedros? left dist tibia 119273 depth 10.7 bridge present Br. 10.5? (more cedros 9.5% only 5 bones)
vit prominence near dist. border + prominent as in cedros

2 cedros? left tarsal shaft 119174 large Br at mid 6.0 m March 9, 1979

8 left coracoid 119253, 119254, 119255 in complete
↑ resembles diptera

8 rt ~~incomplete~~ coracoid 119223
+ ucmp 1 rt mic. 119256, 119257, 119258, 119259 resembles diptera? in shape of head Br head 7.0 ht head 6.6 m

6 scale mauca sp? rt scap 119244, 119247 Br 13.3
left scap 119241, 119243 Br 12.2
rt scap 119372 Br 12.2 (Barnes & Walters Feb 14, 1978)
left scap 119172 Br 12.6

5 mauca sp? rt dist end humerus with shaft 119169 Br 6.65
" " " 119169
humerus shaft 119170
left prox mic " 119171
left dist mic " 119168
Lacm part March 9, 1979

2 cedros? left (prox) humerus + part shaft 119268 Br. 17.1
rt (prox) " 119274 Br. 18?

7 mauca sp? rt dist " 119407 Walters + parts May 26, 1979
left " " 119271 Br 6.7
" " & shaft " 119270 Br 6.4

rt? mic. rt dist ends " 119275, 26, 27, 28 size ok to go with prox ends identical as cedros but no fits also ok for diptera

LACM locality 4301 (and UCMP 68106) (LACM 74, UCMP 1)

Genus Mancalla Lucas 1901

Humeri: distal, ¹ 9; proximal ⁸ 8; shaft ⁸ 6; complete 1	Total ¹⁸ 27 26
Ulnae: complete 6; distal 4; proximal 2; incomplete 1	Total 13
Carpometacarpus: 2 proximal ends	Total ³ 2
Coracoid: furcular facet 2; scapular facaet & glenoid facet 6 (UCMP) incomplete (lacking furcular facet) 1	Total 910
Radius; shaft near proximal end 1	Total 1
Scapula: complete proximal ends 5; incomp/ prox. ends 4	Total 98
Tarsometatarsus: complete 1; shaft 2; distal inc. 1, prox. frag. 1	Total 5 00
Tibiotarsus: incomplete prox. end 1; distal end 4	Total 561
Pedal phalanx, Ident.? 2	Total 2 - 2
Thracic vertebra, ident. ? 1	Total 1 - 74

Grand total

75

1

76

2

78

Santán
miz

wing phalange

57 Mancalla

List of San Mateo Formation bones from upper level

Loc. 4301

Mancalla collected by Larry Danielson

- 17 Humeri: 4 right distal 119275, 76, 77, 78
2 right proximal, 119273, 74
2 left proximal 119268, 69
3 left distal, 119270, 71, 72 (119270 has most of shaft)
1 right shaft near proximal end 119306
4 left shaft near proximal end 119301, 02, 03, 04
1 left shaft near distal end 119305
- 12 Ulnae
2 right complete, 119287, 88
1 right distal end, 119289
4 left complete, 119279, 80, 81 and 83 (see 119282 below)
2 left distal, 119284, 85
1 left (distal end missing) 119286
1 left (proximal end incomplete) 119282
1 left (proximal end diseased and swelled) 119311
- 1 Radius 1 shaft near proximal end, most of prox end broken, 119292
2 Carpometacarpus: 1 proximal end left 119290
1 proximal end right 119291
1 Phalanx 1, digit 2 (wing) 119293 complete
7 Coracoid: 2 left incomplete, 119253, 54 (scap facet and glenoid OK)
3 right incomplete, 119256, 57, 58 (scap facet and glenoid)
1 left upper end (furc. facet OK) 119255
1 right upper end with furc. facet 119259
12 ????? 1 right scap facet and glenoid and part shaft 119307 (ident?)
7 Scapula 1 right proximal end 119267
1 right prox. with articulation incomplete 119266
2 left proximal 119261 and 64
3 left with prox. articulation inc. 119262, 63 and 65
4 Tarsometatarsus: 1 left complete 119298
1 left shaft (no ends) 119299
1 right prox. frag (end inc.) 119297
1 right distal frag. (troch. 3 OK) 119300
3 Tibiotarsus: 1 right distal (inc.) 119296
1 left distal 119295
1 left proximal incomplete 119294
2 Pedal phalanx identification? 119308, 09
1 Thoracic vertebra (identification? 119252
57 SMALL EAGEE ? proximal end digit 1, phalanx 1 119310
IDENTIFICATION? Long, slender pedal phalanx (try Sulidae) 119312
Unnumbered, shaft of humerus, quadrate, dist. carpometa, frag. mandible, frag. rib edge of sternum, frag sacrum

54
+ 1 thoracic
55

119260
(small)
ident 6 + 2 pedal phals. 8
+ 3
11

Over

San Mateo Formation upper level Loc. LACM 4301
Collected by Museum parties

- 8^{ident} Humeri: 1 complete 119165 (poorly preserved)
32 proximal ends 119222, 119224
9 distal ends with shaft 119166-119170
omit 1 shaft? 119170??
1 Coracoid: 1 incomplete 119223
1 Scapula: 1 proximal end 119172
1 Tibiotarsus: 1 distal end, 119173
1 Tarsometatarsus: shaft, 119174

12 Mancalla

San Mateo Formation upper level Loc. UCMP 88614 V68106

- 1 Coracoid: 1 incomplete UCMP 88614

57
17

Bruce Wellman, coll. May 1979

+ pelvis from lower beds

- 2 (✓ 119407 rt dist humerus
✓ 119408 rt prox ulna (Mancalla?))

Bruce Wellman, coll. Aug 25, 1978

- 1 ✓ 119371 dist fibula (left)

Wellman et al. 14 Feb 1978

- 2 (✓ 119373 rt scapula
✓ 119372 prox humerus rt)

5

18 This age all Mancalla

57 Mancalla 1st p

73 + yolk & egg, subalcis

11
84 Total finds 4301 = UCMP 68106

San Diego Nat. Hist. Mus.,
S.D. N.H.M.

★ Robert M. Chandler ms

S.D. formation

Taromelatareus ^{Loc.} 2978 cat # 22916 Gavia

length 60.8 mm. (60.3 to groove of middle toothless)

[~~Stellata 777~~]

^{Recent} Stellata 70.6 g [69.8 to groove of mid toothless]
SDNHM # 37034

refer to this

★ Fossil tarsus 22916 from Wadsworth St. Gavia howardae?
San Diego formation San Diego. @ Chandler
ms
Called by Brian Brockmeier

DO NOT USE
SDNHM loc ^{mis # mistake 2643} 2947 is upper level Oceanside. Brockmeier coll.
Chandler has fragmentary ^{uncatalogued} Cephalus (C.) lunatus from
upper level - show him engraved 119260 from Loc 4301

for reference only
upper level SDNHM coll. by Ken Frasier
loc # 2643 = Oceanside upper level

DO NOT USE
San Diego Mus loc, 3134 lower level coll by
Dean Mataga March 1981 lower jaw frag.
possibly Paleamauralla @ Chandler. He will
record. Now uncatalogued.

60.8 | 70.6
60.8
980

from former notes on humerus & tarsus of stellata
 br dist end humerus 14.0-14.6 M 14.3
 length tarsus 70-72.2 M 71.2

Homomidae br dist humerus 13.1

length tarsus 22916 San Diego Mus. 60.8 (60.3)

San Mateo tarsus 68.6+

$$\begin{array}{r} 109 \\ 13 \overline{) 14.3} \\ \underline{131} \\ 200 \\ \underline{119} \\ 1 \end{array}$$

$$\begin{array}{r} 117 \\ 608 \overline{) 71.2} \\ \underline{608} \\ 1040 \\ \underline{608} \\ 4320 \end{array}$$

ulna of brodskii length 81 mm
 prox 9.4

$$\begin{array}{r} 81 \\ 25 \\ \hline 106 \end{array}$$

ulna brodskii 53.69 smaller than stellata min

★ humerus homidae 14.90 " " of stellata min

$$\begin{array}{r} 70.0 \\ 14.0 \\ \hline 280.0 \\ 7.0 \\ \hline 98.0 \end{array}$$

$$\begin{array}{r} 70.0 \\ 9 \\ \hline 61.0 \end{array}$$

$$\begin{array}{r} 70 \\ 23 \\ \hline 210 \\ 140 \\ \hline 1610 \end{array}$$

$$\begin{array}{r} 70 \\ 14 \\ \hline 54 \end{array}$$

★ clav & tarsus 22916 S.D. Mus. - 1
 → 14.90 smaller tarsus than min. of stellata & humer = 61.0 mm
 23.96 " " " " " = 54.0 mm

$$\begin{array}{r} 106.5 \\ 14.9 \\ \hline 426.0 \\ 106.5 \\ \hline 1491.0 \end{array}$$

$$\begin{array}{r} 106.5 \\ - 14.9 \\ \hline 91.6 \end{array}$$

compare of q. homidae humerus
 with min stellata

1498 p. 15

Human foot ends

left 119222✓; 119269
rt 119273✓; 119326✓

In contact with
angular profile in
m. calid. dignus

T. mulleri T.
broader more square
area below the head

resemble those of *Manicella celsiorum*
the gradual curve of the shaft internally
from through the bisulcal crest

and area below head between posterior
~~costal~~ attachment + pneumatic fossa oval &
deeply depressed.

Harvard 1971:117

char. of humerus
advised

Ulna 119283 27.9 (8.7) prot. diff.
119286 - 8.6 (small) (miller?)
8.6 (miller?) depth

Ulna 119280 - prot. diff. alacum

119281 - prot. diff. alacum

119282 - prot. diff. alacum

119283 - prot. diff. alacum

119284 - prot. diff. alacum

119285 - prot. diff. alacum

119286 - prot. diff. alacum

119287 - prot. diff. alacum

119288 - prot. diff. alacum

119289 - prot. diff. alacum

119290 - prot. diff. alacum

119291 - prot. diff. alacum

119292 - prot. diff. alacum

119293 - prot. diff. alacum

119294 - prot. diff. alacum

119295 - prot. diff. alacum

119296 - prot. diff. alacum

119297 - prot. diff. alacum

119298 - prot. diff. alacum

119299 - prot. diff. alacum

119300 - prot. diff. alacum

119301 - prot. diff. alacum

119302 - prot. diff. alacum

119303 - prot. diff. alacum

119304 - prot. diff. alacum

119305 - prot. diff. alacum

119306 - prot. diff. alacum

119307 - prot. diff. alacum

119279 very large (31.7 length) 10 depth from not quite complete

T H E I N F O R M E R

MARCH, 1981

Mon	23	7:30	PM	Los Angeles Mycological Society (Dr. Reynolds)	Lounge
Tue	24				
Wed	25	4:00-9:00	PM	Unitrex Tour Reunion (Mrs. Astone)	Member's Lounge
Thur	26	9:45-2:00	PM	Docent Observation and Training - Early American History - Docent Research Papers (Mrs. Astone)	Astone Office - In Hall
Fri	27	8:00	PM	Lorquin Society (Dr. Hogue)	Lounge
Sat	28	9:00-4:00	PM	Science Workshop (Mr. Durham)	Durham Office- Av/Cr.
		2:00	PM	Saturday Film Series - "AUDUBON" color - 58 minutes (Mr. R. Young)	Aud
Sun	29	2:00	PM	MUSIC PROGRAM - The Hollywood Chamber Orchestra (Mr. Lipscomb)	Aud/ Lounge

TO ALL STAFF:

Just a reminder - - all staff are invited to take a free audio tour and pick up a poster of the Hawai'i The Royal Isles Show. Just pick up your poster and Acoustiguide from the docent in the gallery - - Tuesday through Sunday.

Fossil Birds from Oceanside localities

Harry Harwood

UCMP 68147

Uria new species, nine bones UCMP no. 88704

Praemancalla? large axis-vertebra UCMP no. 102428

same locality

UCMP 6880 upper bed?

Indet. furcula UCMP no. 88597 (falconiform?) - size similar to Pergine falco

LACM 4297 Diomedea distinct tibiotarsus LACM 119353 - 1 bone

Praemancalla wetmorei partial skeleton (6 bones) LACM 107028

Praemancalla? scapular end of coracoid (frag.) LACM 107030

Aethia? sp. indet. tiny humerus lacking prox. end LACM 107031

Cephus new species? nearly complete humerus LACM 107032

Praemancalla sacrum/wapilus LACM 119406

UCMP 68144

Indet. sp. poorly preserved scapula UCMP 88646

Indet. pedal phalanx UCMP 88640 (Digit 3)

same locality

LACM 4298

Praemancalla incomplete humerus LACM 107029

UCMP 68145

Gavia sp. complete tarsometatarsus UCMP no. 88656

Praemancalla ??? slender femur lacking prox. end UCMP 95118

Praemancalla? incomplete scapula UCMP 95119

same locality

LACM 4299

No birds

UCMP 68106 Mancalla sp. incomplete coracoid UCMP 88614

same locality

LACM 4301

Mancalla sp. 27 humeri, 13, ulnae, 2 carpometacarpi, 1 radius, 9 coracoids, 9 scapulae, 5 tibiotarsi, 5 tarsometatarsi, (thoracic vertebra? and 2 pedal phalanges?)

- Small eagle proximal end of digit 1, phalanx 1 (LACM 119310)

- Sulidae? long, slender pedal phalanx (LACM 119312)

Unidentified and unnumbered, humerus shaft, quadrate, distal end of carpometacarpus, fragment of mandible, fragment sternum (rib edge), fragment of sacrum

- Alcidae fragmentary coracoid LACM 119260, distal end tibiotarsus 119260 #121532

check this

UCMP 6880 upper bed

check sacrum from lower level #?, LACM 119406

37
26
13

Loc. UCMP 68106 (upper)

Coracoid 88614 Manacalla

Loc UCMP 68145

Manacallin left scap. R. 13.7 88614

"? left hum 95118

Jawia comites left tarsal 88654

69.3 left H

11.9 Int. B.

13.1 forearm abn. mid tooth

Loc V 6880

rt claudel UCMP 88597 Salicoida?

UCMP loc 68144

pedal phalanx # 88640 sp?

left scap. # 88646 sp?

UCMP 68147

~~atla~~ axis vert. # 102428 Pramaucalla?

ulnae, radius, coracoids, scap. Uria n. sp. # UCMP 88704

carpo (dist) Uria n. sp.

UCMP 68144

Scap. left 88646 sp?

4301 humeri (23) (coracoid 8 + 1 humerus) scap. 9, tibia 5, tars. 3, radius 1, carpo. 2

119456/66/67/68/69/70/71/ scapula 119172 tarsal 119174

119222, coracoid 119223

119224, vert 119252

Cor.

act.

119253/54/55/56/57/58/59

scap.

119262

and 119263

119266/67

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Cephirus extrinck species LACM 107032, right humerus,
from Loc. LACM 4297, collected by Robt Makenzie
19 March 1975.

The proximal end resembles the humerus of Cephirus
columba Pallas 1811 in degree of depression below the head
and position of the pectoral attachment.

The specimen resembles the humerus of species of
the genus Columba ~~as distinguished from those of the genera~~
~~in that it has a less compressed shaft than~~
^{area} ~~it has~~ and is similar in having a broader, less compressed shaft.
^{Proximal} It resembles ^{the humerus of} C. columba in the degree of depression below the
head & position of the pectoral attachment.
refer to Cephirus cf. ulna from LACM 6906 (sect. 11.050
ms)

LACM 4297

1 Praemancalla wetmorei Howard 1966, partial skeleton (6 bones) LACM 106028

2 Praemancalla ?wetmorei, scapular end of coracoid LACM 107030

Cephus Pallas 1769 new species (Howard Ma) nearly complete humerus
LACM 107032

Aethia Merrem 1788, indet. species, humerus lacking proximal end

3 Praemancalla ? scapula part phalanx #3

LACM 107031

UCMP 68147

Uria Brisson 1760, new species (Howard Ms), 9 bones associated UCMP 88704

4 Praemancalla ?wetmorei axis vertebra UCMP 102428

UCMP 6880

Family Falconidae?, incomplete clavicle UCMP 88597

LACM 4298

5 Praemancalla ?wetmorei incomplete humerus LACM 107029

UCMP 68144

Indeterminate species, poorly preserved scapula UCMP 88646

Indeterminate species, pedal phalanx UCMP 88640 (digit 3) 1968

UCMP 68145

Gavia Forster 1788, indeterminate species, tarsometatarsus UCMP 88656

6 Praemancalla ?wetmorei incomplete scapula UCMP 95119

7 ?Praemancalla, femur lacking proximal end UCMP 95118

UCMP 4299

No birds

UCMP 68106

Mancalla coracoid UCMP 88614

LACM 4301

Alcedo sp. Coracoid in complete LACM 119260

Mancalla many

In Ambled but
Do all upper
level together
in the order against
T all lower level
separated

62	Mancalla
12	Praemancalla
1	Cephus
9	Uria
1	Aethia
1	Gavia
3	Indet
1	Alcedo
90	Total

Birds from San Mateo juco

1st UCM P material
received

✓ *Uria* sp. V68147 / 88704 : axis vertebra (not same sp.)
9 bones
sternal ends R + L coracoids (includes pectoralis
(? left scapula, complete left ulna, dist. rt. ulna
RTL dist. radii, dist. 1 carpometacarpal, 1 wing phalanx)

✓ *Chendytes*? V68145 / 95118 - badly worn left femur (head missing)
1 bone
DONE

✓ *Gavia* sp. V68145 / 88656 - complete left tarsus
1 bone
inc scapula
DONE

✓ *Imo* sp. ? 1 bone V68145 / 88646

✓ *Mareca* V68145 / 95119 - R scap.
2 bones
DONE

✓ V68106 / 88614 - inc. left coracoid (fine facet broad)

Sp. ? V6880 / 88597 - ~~Wing~~ inc femur
~~Wing~~
V6880 - clavicle 2
88597 - talonid?

V68144 / 88640 - pedal phalanx

Uria sp. V68147 / 88704 - 9 bones
Chendytes? V68145 / 95118 - 1 bone (femur)
Gavia sp. V68145 / 88656 - 1 bone (tarsus)
Mareca V68145 / 95119 - 1 scapula
V68106 / 88614 - 1 coracoid
V68147 / ? - 1 axis vert
V6880 / 88597 - 1 frag clavicle
V68144 / 88646 - 1 frag scapula
V68144 / 88640 - 1 pedal phalanx

u

San Mateo Location

Gaviá

Use NO

TBALÉ

Measurements (in millimeters) of fossil tarsometatarsus
UCMP 88656 compared with Recent species of Gavia

	UCMP 88656	<u>G. immer</u>	<u>G. stellata</u>	<u>G. pacifica</u>
Greatest length	69.5	81.3-91.3	69.7-72.3	67.1-75.9
Least breadth	3.8	4.5- 5.1	3.3- 3.7	3.6- 4.0
Greatest depth	6.8	7.5 - 9.0	7.1- 7.7	5.1- 7.0
Breadth proximal end	12.0	14.0-15.6	11.4-12.0	11.4-12.8
Ht of int. foramen?	6.9	6.7 - 6.4	3.6-5.1	3.6-3.1

use these only

length of groove

68.6

~~xxxxxxxxxxxxxxxx~~
80.3 90.1~~xxxxxxxxxxxxxxxx~~
68.9-71.4~~xxxxxxxxxxxxxxxx~~
66.2-75.3 m 70.1

Table i.

Measurements (in millimeters) of fossil and modern loon bones

	Humerus		Ulna		an length
	Breadth dist. condyles	Breadth shaft above brachial depression	Breadth prox. end	Breadth of shaft	
1. <i>G. concinna</i> Type (Wetmore, 1943:27)			9.4	4.9	81.00
2. Referred (Brod- korb 1955:6)	12.5-13.1	8.4- 8.8	11.7	5.8	5.3 ref # 59
3. <i>G. paleodytes</i> Referred (Brodkorb, 1955:6)	11.7-12.4	6.9- 7.1			
4. <i>G. howardae</i> Type Range (Brod- korb, 1953: 213)	10.5 ^a 9.2-10.2	6.8 ^a 6.2- 6.8			
5. <i>G. immer</i> 4 specimens	13.3-15.3		12.6-14.5	6.2- 6.8	
6. <i>G. a. pacifica</i> 5 specimens	10.9-12.7	6.6- 8.3	9.9-11.7	4.6- 6.1	106 mm
7. <i>G. stellata</i>	10.5-11.3	6.7- 7.3	9.5-10.5		

^a my measurement of type for this study. Brodkorb gave only max + min without specifying type measurement

Table 2

Measurements (in millimeters) of fossil tarsometatarsus compared with modern species of loons

Fossil no.	Length	Breadth prox. end	Least breadth shaft	Greatest depth of shaft	
88656 ^{Depth to trough of mid trochlea} 68.6	69.5 ³	12.0 ²	3.8	6.8	wt frn
<i>G. immer</i> 66.3-75.5 m 70.1	81.7-91.3 ³	14.0-15.6 ⁸	4.5-5.1 ⁵	7.5-9.0	6.3
<i>G. a. pacifica</i> 68.9-76.9 m 70.2	66.9-75.9 ⁸	11.4-12.6 ⁸	3.1-4.0 ⁶	5.1-7.0	
<i>G. stellata</i>	70.0-72.2 ⁴	11.3-12.0 ⁴	3.3-3.6 ⁷	7.1-7.7	4.6
<i>G. paleodytes</i> ref. type	45.2	24.4-26.5 26.1	5.3-6.6 6.8	least depth 3.6-3.7	wt benam + min
<i>Tarus coninus</i> San Diego form 4442 117718	62.7	pur end 40.9	3.5	3.0	7.6
<i>Capishans form</i> 3891 2	?	?	?	5.0	7.5
San Mateo form 88656	69.4	12.2	3.8	6.7	7.3+

Measurements - *Garra chishimensis* + dist. tibio.

No		Measurements							Tibio tars		ulna			
		excl. condyle	dist. humerus	condyle	incl. condyle	incl. condyle	incl. condyle	sh. depth	br. dist ant	depth dist	med. dist	prox. length	dist. dist	sh. dist
sallata	328	13.1	16.9	8.8	10.6	13.9	5.9	7.4	11.0	11.65	5.3	10.0	9.4	6.0
	327	12.6	17.9	8.3	10.3	13.1	5.4	6.3	10.8	11.5	4.5	9.8	8.6	5.4
	1020	13.3	18.4	8.8	11.2	13.6	5.6	6.9	11.2	11.75	4.65	10.4	10.8	9.4
	788	12.7	16.9	8.4	10.4	13.1	5.2	6.7	11.2	11.75	4.65	10.0	10.4	8.8
		mean 12.43							mean 11.03	mean 11.77				
paciua	28	14.28	20.5	9.3	11.4	15.4	6.5	7.2	11.1	11.6	4.9	11.1	11.2	6.6
	306	14.6	19.5	8.5	11.6	15.0	5.9	2.2	11.4	11.5	4.9	11.4	10.9	6.6
	304	14.6	19.7	9.3	11.5	14.8	6.3	7.35	11.1	11.1	5.7	11.2	11.7	10.3
	305	15.0	21.1	9.6	12.3	15.8	6.6	7.8	11.75	12.75	6.2	11.8	12.4	11.2
		mean 14.625	mean 20.2			mean 15.24			mean 11.33	mean 11.73				

Howardae	11.7	9.3	11.85	4.9 x 6.1
2133 from San Diego 1080	12.6	10.0	12.7	4.9 x 6.5?

31630 loc 65/21 East Calhoun, Dec 1964	13.8	11.25	14.0	Loc 3891 Capetian Musin Vireo
--	------	-------	------	-------------------------------

Howardae type	12.35	10.0	5.4 x 6.5	shear
---------------	-------	------	-----------	-------

2144 assigned concave by Brothub	22.5	10.0	from ext to med. crest depth head
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8.8 8.7 ident? manilla?

Loc 1080 San Diego #2314 assigned by Miller

Hypolytic Howardae @ L Miller fig 1957

64610 1080 11.4p 11.65 after Kuhlman 1974 very eroded

concave cart type	6.35	11.6	11.5/7.5
ulna	4.9	9.4	8.6
31618 from 65/21	5.0	8.2	8.2
Loc 3891	5.7	11+	7

Four extinct species of loons have been described from the Tertiary of North America: Gavia concinna Wetmore 1940 from the Middle and Late Pliocene (Etchegoin and San Diego Formations) of California and the Middle Pliocene (Bone Valley Formation) of Florida, G. paleodytes Wetmore 1943 from the Bone Valley Formation, G. howardae Brodkorb 1953 from the San Diego Formation, and G. brodkorbi Howard 1978 from the Late Miocene (Monterey Formation) of California.

The tarsometatarsus has not been recorded for any of these species. But recently two specimens have been recovered. One is from the upper part of the Capistrano Formation in Orange County (LACM locality 3891) California, considered to be equivalent in age to the San Diego Formation (LACM locality 4442). The other is from the San Diego Formation. The former, ~~though~~ is equivalent in general size to UCMP 88656 from Ocnaside but the distal foramen is well below the edge of the internal trochlea and only ~~3.4~~ ^{5.0} mm above the intertrochlear notch. The specimen from ~~XXXXX~~ LACM locality 4442 is notably shorter (length 62.7 mm). And again the distal foramen is much lower than in UCMP 88656.

In the descriptions of the fossil species, broad references are made to size in comparison to modern species: G. concinna between G. immer on the one hand and G. stellata on the other; ~~xxxxxxx~~ ^{An G. a pacifica} G. paleodytes a "small species about the size of the red-throated loon, G. stellata" (Brodkorb, 1955:5); G. howardae smaller in size than G. paleodytes (loc cit.). Comparing the measurements given with comparable measurements on a series of modern skeletons in the LACM collections, we find that these generalities will not suffice for placement of the tarsometatarsus

with G. concinna the largest (between G. immer ^{on the one hand} + G. pacifica ^{skeleton}) + G. howardae the G. paleodytes next (about the size of G. pacifica) ^{on the other} ~~even smaller (probably smaller than G. pacifica or G. stellata)~~

Keep other side measurements

1020, 328, 788, 1327
~~TScap~~ ~~and female~~

~~T. Scafo~~

~~Scap~~ Scap

fossil
Saurmat.

Jawid

Length to trough on middle trochlea in 88656 is 68.6
 4 ♀. *Pacificus* same dimension 66.2 - 75.3 Mean 70.1
 4 ♀. *stellatus* " " 68.9 - 71.4 " 70.2

Oct. 9, 1952 Gavia

~~The taxon melanocephalus is not known in any of these species. And the~~

On the basis of size, ~~however~~, Gavia concinna appears to have been a larger, heavier bird than either of the other two species and ~~was~~ I would judge it to have been larger also than the sp. rep. at Ocean Mills. The only ^{complete} element ~~for~~ ^{described} referred for any of these sp is the femur. ~~the referred femur of G. concinna is from the Bone Valley Lm. and~~

In the Bone Valley Lm. in near Brewster, Fla. Bludhorn (1953 p. 212) cites 2 femora. ~~one assigned to one~~

assigned to G. concinna has a rel. br of sh. to length 15.4% ^{is only 3.5mm shorter but has} 91% of length of G. concinna
the other " " G. pallidipes " " " " 12.7% 73% of length of G. concinna

	rel. to length	
✓ br. thru head	concinna 37.0%	
" " "	pallidipes 32.4%	
✓ width thru condyle	concinna 39.3%	
" " "	pallidipes 33.4%	
✓ ratio of depth pal / cond.	71.2%	
✓ " " br head	80%	
✓ " " br condyle	18.2%	
✓ " " br sh	7.5%	
✓ " " length	91%	

	Depth of skull	concinna	21.2%
" " "	pallidipes	16.3%	
" " "	stellata	15.5, 19.2, 19.2, 18.7	
" " "	pac.	17.2, 17.8, 17.5, 18.1, 18.6	
" " "	unus	17.4	
length femur	concinna to pac	- 106%, 97%	
" " "	to stell	- 114%, 111%	
" " "	taurus oceanus to pac	97.5%, 103%	
" " "	to stell	99%, 96.6%	
" " "	femur pallidipes to pac	97.7, 89.3	
" " "	to stell	104.5%, 102%	

	br sh to length	stellata	14.0, 12.1, 15.1, 14.4
✓ least br sh to length	pac.	10.6, 13.5, 14.0, 13.6, 13.5	
" " "	commun	15.4	
" " "	unus	11.9	
" " "	pallidipes	12.7	

taurus
br sh to length 5.5, 4.4, 4.5
5.6, 5.4, 4.5
fossil oceanus - 5.1

	ratio br dist to G. stellata	110.8 - 103%
G. pallidipes humerus	G. pac.	107.7% - 94.9% - 96.9%
" " "	G. stellata	92.9%, 92.1%, 86.7%, 85.9%
" " "	G. pac.	85.2%, 97.9%, 88.7%, 77.8%
Oceanus taurus	G. stell.	100%, 107%, 104%
length femur pal to stell	G. pac.	97.4%, 115.9%, 94.9%
" " " " pac	taurus stell to pac length	85.9% - 87.5, 95.7, 92.7
" " " " stell	taurus " " pac	103%, 97.7%, 107.9%, 101%
" " " " pac		103 - 97.5

Aug 27, 1978
2

Keep other side
measurement

Copied
part in conclusion
The occurrence of the genus Praemancalla in the lower ^{white sands} ~~levels~~ and Mancalla in the ^{deposits higher in the stratigraphic section} ~~upper~~ is of importance in providing information as to the relative ages of the beds at the two stratigraphic levels. Both genera are members of the extinct subfamily Mancallinae, flightless auks of the family Alcidae. Praemancalla is known heretofore only from the Late Miocene, Monterey Formation, whereas Mancalla is a dominant genus in early to late Pliocene marine deposits of southern California and Cedros Island, Baja California.

SYSTEMATICS

Order Gaviiformes

Family Gaviidae -- Loons

Genus Gavia Forster 1788

Referred material.-- Left tarsometatarsus UCMP 88656 from UCMP locality 68145, collected by UCMP party.

And Red-throated Loon Gavia stellata
Doesn't hold
Discussion.-- The fossil tarsometatarsus is ^{within the size range of} comparable in size to tarsometatarsi of the living Pacific Loon, Gavia pacifica Lawrence (Brunnich 1764) 1858. It resembles this species as well as Gavia immer, in contrast to Gavia stellata, in the position of the hypotarsus more markedly inset from the external edge of the shaft and in lesser depth of the internal side of the shaft toward the proximal end. ^{OK} It differs from all three living species in the high posterior position of the distal foramen, its proximal border being near the level of the proximal edge of the internal trochlea and 6.9 mm above the external intertrochlear notch. In G. pacifica and G. stellata the foramen is well below the proximal level of the internal trochlea and only 3.6 to ~~5.2~~ 5.0 mm above the notch. Even in the largest available specimen of G. immer, the posterior height of the foramen is only 6.4 mm above the notch.

although the length is below the mean for all the species.

To be continued

Measurements Loon tarsi

distal
 proximal
 9. length
 90. brs
 3.53
 3.8 x 4.6
 12.2
 17.78%
 6.9
 distal
 2. thick
 6.3
 7.

Stellata
 328 71.4 72.2 4.76 3.4 x 7.0 12.0 16.82% 4.5 8.0 7.54
 327 70.4 71.5 4.68 3.3 x 6.2 11.4 16.19% 5.1 7.25 6.7
 1020 68.9 69.7 5.37% 3.7 x 6.4 11.9 17.27% 4.5 7.6 7.45
 788 70.3 71.1 4.53 3.4 x 4.5 11.9 16.92% 4.1 7.8 7.0

Pacifica
 28 68.3 69.0 5.27% 3.6 x 6.4 12.0 17.56% 4.55 8.3 7.65
 306 70.7 71.5 5.23 3.7 x 6.7 11.8 16.69 4.7 7.8 6.8
 304 66.2 67.1 5.74 3.8 x 6.5 11.8 17.82 3.6 8.1 7.4
 305 75.3 75.8 5.31 4.0 x 6.85 12.8 16.99 5.0 8.35 7.7
 Mean 70.2 71.1 5.33 3.6 12.1 17.26

inner
 761 81.7 82.3 4.5 x 7.0 14.3 5.9 9.25 8.1
 1115 88.8 89.9 5.25 x 7.9 15.6 6.4 10.55 9.7
 1115 84.75 85.8 5.5 x 7.9 15.5 6.1 10.2 9.8
 830 90.1 91.3 4.5 x 7.5 15.8 4.9 11.5 9.7
 28A 80.3 81.3 4.5 x 6.5 14.1 6.15 9.5 8.5

#117778
 61.6 62.6 5.68% 3.5 x 5.7 10.7 (17.39%) 3.6
 (7.5 dist) 6.74
 9. stellata mix adult than pacifica

born for
 4442 Sait
 Duff
 Runway way
 at Brookline
 Feb 24, 1978
 Mark Wheeler
 r Mark Wheeler

live 3891
 Capistrano from
 Mission Viejo
 LW Angus
 9. September
 21 March 1978

distal
 half

3.75 x 6.4 ~ 5.04 8.0? 7.6?

90 length
 17.78% fossil prox br. 12.2
 mean 16.19 Stellata 11.4-12.0 mean 11.8
 mean 17.26 Pacifica 11.8-12.8 mean 12.1
 fossil 9. length 69.3
 stellata 69.7-72.2 mean 71.12
 pacifica 69.4-75.8 mean 70.85
 90 length 5.5320
 90 length mean 4.91
 90 length mean 5.38

Laona Humeri

See tarsus (attached)

Ulna

ulna

Tarsus

crani

	dist br condyle only	gn br dist	br fix humer dist + sub.	Depth head	dist diag br. thru epi condyle	sh depth above brach. dip.	sh breadth above brach. dip.	Length humer to dist condyle	Br fix ulna	least mid br sh	gn mid br sh. -dist?	R. Length	Length core fram to stern end	Length	width glen head	least width sh	gn dist on	br humer condyle	Br cora.
type	8.2-10.2				12.4-14.4	4.7-5.2	6.2-6.6												
G. howardae	10.5	12.9			14.2	5.1	6.8												
" 2133	9.4	11.8			12.2	4.7	6.7												
" 2173	10.2	12.7			13.3	4.6	6.6												
Leucosticte	12.0	13.9			14.3	4.9	8.5												
G. schlegelii	10.5	12.8	17.0	8.5	14.1	5.0	7.0	131.7	10.1	4.5	5.4	106.6	21.5	37.7	14.2	5.3	7.0	14.4	5.5
788	10.9	13.1	16.3	8.6	14.0	5.3	6.7	132.1	10.0	4.7	5.9	106.45	21.1	37.4	12.75	4.9	7.2	14.0	5.0
328	10.3	13.9	17.4	8.7	14.5	5.7	7.3	132.9	10.3	5.2	6.05	107.25	21.65	38.1	14.7	5.9	7.8	14.4	
✓ 1020	11.3	13.6	17.8	8.7	14.4	5.4	7.2	135.0	10.6	4.6	5.9	110.0	21.8	38.5	14.3	5.55	7.2	14.3	
G. a. pacifica	10.9	13.3	17.6	8.4	13.8	5.0	6.6	135.8	9.9	4.6	5.8	111.9	26.0	40.3	12.8	4.3	6.9	13.35	5.5
306	11.9	14.9	19.4	9.6	15.3	5.8	7.8	137.8	11.3	5.4	6.75	112.1	24.9	40.5	13.5	5.5	7.2	13.9	5.8
28	11.5	15.0	19.6	9.3	15.8	5.9	8.1	140.5	11.2	4.8	6.6	112.8	25.3	40.65	14.5	5.7	7.1	13.7	6.5
305	12.7	15.2	21.5	9.6	15.8	6.4	8.3	152.1	11.7	6.1	7.3	123.4	28.25	44.0	15.7	6.0	8.0	15.6	6.7
304	12.0	14.7	18.6	8.6	15.3	6.0	7.8	137.6	11.5	6.1	7.0	112.7	26.0	40.65	13.6	5.5	7.6	14.0	
Say's Phoebe	11.9	14.4	21.8	10.0	-	-	-	-	11.0	5.4	6.6	114.5	26.0	41.0					
G. immanis	13.3	17.0	22.4	11.2	17.8	7.4	10.0		12.6	6.3	7.8	1	30.7	50.5	16.0	6.0	8.8	16.4	7.4
1115	15.2	18.8	25.8	12.0	19.5	6.6	9.0		14.6	6.8	8.5	148.4							
830	15.3	18.5	24.9	12.2					14.5	6.2	8.4		36.4	53.6	18.5	7.3	9.8	17.8	9.2
G. concolor	13.1	17.1	21.5	10.1	16.7	7.0	8.8		11.7	5.8	7.2		42.7	15.8	6.6	9.0	16.8		
Paleontor	11.7	14.7	19.3	9.5	14.3	6.1	7.1						26.5	39.2	12.7	5.0	6.4	13.1	6.8

Tarsometatarsi

	a gr. Length	b Br prox	c 2 out center to mid. end. Br. dist	d Br shaft (middle)	e Depth inside shaft ✓	f Depth outside shaft ✓	g Depth ext shaft ✓	h Br base hypo- tarsus	i Br base hypo- tarsus	ba %	fg	fa	ab	bb	x br y aut ht g br above distal space	xy	ea	ia
Aussie 88656	69.5	12.0	$\frac{7.3}{7.5}$	(3.8)	(3.3)	(5.9)	(6.0)	above middle 6.8	3.33	17.25	56.90	4.7	31.7	27.5	$\frac{6.7}{8.0}$	83.7%	5.7	9.7%
Q. pacif.																		
305	758	12.6	$\frac{8.5}{9.0}$	4.0	4.0	6.0	6.9	(7.0)	4.15	16.6	61.690	5.3	31.7	31.8	$\frac{4.6}{7.8}$	59.8%	5.3	9.2
306	(71.5)	11.6	$\frac{7.8}{8.2}$	3.7	3.6	(5.75)	(6.0)	(6.75)	3.4	(16.2)	62.590	5.0	31.9	31.1	$\frac{5.0}{9.3}$	43.7	5.2	9.4
28	(69.4)	11.9	$\frac{8.2}{9.2}$	3.6	3.8	(5.8)	5.6	above middle 6.6	3.25	(17.25)	65.390	5.3	30.3	31.9	$\frac{4.0}{8.5}$	72.9	5.2	9.4
304	66.9	11.5	$\frac{8.1}{9.1}$	(3.8)	4.3	5.8	5.9	above middle 7.1	3.2	17.2	74.90	6.4	33.0	37.4	$\frac{3.8}{5.8}$	65.5	5.7	10.6
immature? 673	(68.2)	11.4	$\frac{7.7}{7.8}$	3.1	(3.2)	4.8	5.0	5.1	2.8	16.9	66.890	4.7	27.2	29.1	$\frac{4.6}{6.5}$	69	4.5	2.4 immature?
Q. stellata	$\frac{51.3}{70.3}$	$\frac{11.4}{11.8}$	$\frac{7.7}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$
328	72.2	(12.0)	$\frac{8.2}{8.5}$	3.4	4.75	6.4	6.8	7.7	3.5	16.6	74.3	6.5	28.2	39.6	$\frac{4.4}{7.4}$	59.5	4.7	10.6
788	71.2	11.9	$\frac{7.8}{7.9}$	3.4	4.2	5.3	5.7	7.35	3.4	16.7	79.2	5.9	28.5	35.3	$\frac{4.0}{7.6}$	53.6	4.7	10.2
327	71.5	11.3	$\frac{7.2}{7.3}$	3.3	4.1	5.2	5.6	7.1	3.4	(15.8)	78.8	5.7	29.2	36.2	$\frac{5.0}{7.8}$	64.0	4.6	9.9
1020	70.0	11.9	$\frac{7.6}{7.6}$	3.6	—	5.3	6.1	spandance 7.7	3.35	(17.0)	—	—	30.2	—	$\frac{4.7}{8.4}$	56	5.1	11.0
Q. unim	$\frac{28.49}{71.2}$	$\frac{11.4}{11.8}$	$\frac{7.7}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$	$\frac{11.4}{11.8}$	$\frac{51.3}{51.6}$
830	91.3	15.6	$\frac{10.4}{10.8}$	4.7	4.3	6.9	8.2	8.3	4.7	17.1	62.4	4.7	30.1	27.5	$\frac{5.5}{7.1}$	77.5	5.1	
781	82.5	14.2	$\frac{9.2}{9.3}$	4.5	4.45	6.25	7.7	7.8	4.0	17.2	71.3	5.4	31.7	31.3	$\frac{5.9}{8.8}$	67.0	5.4	
28A	81.7	14.0	$\frac{9.4}{9.6}$	4.6	4.1	5.7	7.9	7.5	4.5	17.1	71.7	5.0	32.9	29.2	$\frac{6.3}{8.9}$	71.0	5.6	
W15	90.0	15.2	$\frac{10.7}{11.3}$	5.1	5.35	7.4	9.2	9.0 sic	5.2						$\frac{5.7}{9.5}$	5.65		

On the basis of size Gavia concinna appears to have been a larger, heavier form than either of the other two Pliocera species, and presumably exceeded in size the species represented by the Oceanuside tarsometatarsus. However, the type (proximal end of ulna) of G. concinna exceeds in size

the mean for Gavia a. pacifica ^{but a max specimen of G. pac. is equalled by the maximum for the latter form}

exceeds in prox. breadth it is short dimension

humeri referred to G. concinna (Brinkley) the largest exceeds G. pacifica in breadth, the smallest is approx. equivalent to the max pacifi. The Oceanuside tarsometatarsus also falls within the size range of Gavia a. pacifica but at more nearly except length. The largest a. pacifica is 1.3 mm longer. The mean level (the length is below the mean, breadth measurements above). Neither ulna nor tarsometatarsus

is known for G. paleodytes or G. howardae. In the former distal breadth of humerus equals the mean for this measurement in G. a. pacifica, but in G. howardae this measurement falls below the range of G. pacifica and barely within that of G. stellata. The form assigned to paleodytes is smaller than pac. in all meas.

Compared with Gavia a. pacifica The type prox end of ulna of G. concinna is equalled in prox breadth & exceeds in dimension of shaft by the max specimen of the LSCM series of the living form. ^{the 2nd estimate} The humeri assigned to G. concinna (Brinkley) one is larger than other smaller than the max for G. pac. The single referred form is shorter, but broader than G. pac. max.

The type form of G. paleodytes ^{approx. the mean} falls within the size range of G. pacifica in length. A second referred caracoid ^{& smaller} (Brinkley) ^{is} ^{smaller} than the form (op cit) falls within the size range of the G. pac. series. The type & referred distal heads of humeri of G. howardae

Oreanside tarsometatarsus

Length = smallest pacifica
 prox br = largest stellata, a bit above aver pacifica
 sh. br = about aver. pacifica, larger than stellata
 sh of br int within 6th " stellata but on large side
 " " " " " within pacifica, smaller than stellata

Imm

		br sh humerus	length hum	br prox hum	length hum	br sh
Ordist Humerus	stellata	7.0	132.9	10.2	37.4-38.5	49-5.9
	pacifica	6.7-7.3	131.7-135.0	10.1-10.6	40.3-48	43.-6.0
	pacifica	6.6-8.3	135.8-152.1	9.9-11.7		
	pacifica	7.7	140.7	11.0		
	pacifica	7.1				
Humerus	stellata	(6.2-6.8)				
	pacifica	8.4-8.8				
	pacifica					
Tarsus	stellata					
	pacifica					
	pacifica					
Prox	stellata					
	pacifica					
	pacifica					
Dist	stellata					
	pacifica					
	pacifica					

1409178 132917800
6645
Among the recent species propatius vary, humeri & ulnae & coracoids & femora average length is 9. pr. than in *S. stellatus* (with no overlapping of ranges) whereas *farai* are size shorter

recorded for *tylos* & *reptilis* (Rendknecht 1955 p. 6)
G. howardae falls ~~at a~~ ranges near or below the min.,
G. paludicola completely within the range of the next form
 and *G. concinna* near or above the max. On this basis
 the tarsometatarsus ~~which~~ in question falls near the
 median position with respect to *G. pac.* in length & in b.p.
 but distal b.p. is less than the min. & b.p. is
 greater than the max. most measurements, ~~and~~ ^{is} suggestive
 of *G. paludicola*. But the mean to be
 the three living sp.

median
 for end, but distal
 greater than the max, most measurements
 closest affinit with *S. paludatus*. But the measurements
~~are not~~ But even in the three living sp,
 that the relative size of tarsus & humerus varies. The
 humerus of skeleton for example, the humerus of ♀ par. ^{compared to par 5. skull} ~~is~~ ^{is} ~~1.290~~ ^{1.290} slater equal
 nearly 690 longer ~~than~~ ^{r13 broadened distally} whereas the tarsus is 1.290 slater equal
 to ♀ skull in aver. per 6.

[illegible]

Comparing the measurements of the types of *Gavia* species, with a series of five modern skeletons of *Gavia arctica pacifica* in the LACM collections, we find ^{the} proximal breadth of the ulna of *G. concinna* to be equalled by the maximum specimen of *G. a pacifica* and shaft breadth slightly exceeded by no 305.

Comparing the ^{published} measurements of the types of these species with a series of 5 modern skeletons of *Gavia a pacifica* in the LACM collections, we find the type ulna of *G. concinna* to be within the maximum range ^{of the Bennett series} in breadth of prox end + shaft; the type coracoid of *G. paleodytes* also ~~is~~ ^{is} approximately equal to the mean of *G. a pacifica* in length from foramen to sternal end, but heavier of shaft and the type distal end of humerus of *G. howardae* to be smaller than the minimum *G. a pacifica* in distal breadth but slightly above in shaft breadth.

Comparing the published measurements of the types of these species with a series of 5 modern skeletons of *G. a pacifica* in the LACM coll. we find all three fall within the size range of the living species in certain measurements, with *G. concinna* at the maximum level, *G. paleodytes* at the mean and *G. howardae* near the minimum. The tarsometatarsus at hand is close to the mean of *G. a pacifica* in length & ^{distal} proximal br. well below the min. ^{width of 6, 7} but equal to the max. in shaft breadth.

On the basis of size ^{the type referred distal humeri of} ~~*Jania howardae*~~ ~~are~~.

On the basis of size compared with *J. a. pacifica*, the basilar at hand is close to the mean of the ^{living species as represented} ~~in a series of 5 lacm specimens.~~ ^{the type + referred humeri of} ~~*J. howardae* are~~ ~~all of lesser breadth than smaller in all smaller~~

~~all distal breadth than~~ below the size range of *pacifica* in distal breadth, but ~~two specimens~~ the type + one referred specimen overlap the minimum of *pacifica*.

At the opposite extreme in size is *J. concinna* in which the type ulna agrees with the max *J. pac. ulna* in prox breadth ~~and~~ referred humeri equal or exceed the max. and ~~the~~ the referred femur though within the range of *pac* in length exceeds it in all breadth measurements. *J. paleodytes* is within the size range of *pacifica* (near the mean) in measurements of the type coracoid and referred humeri. One coracoid + a femur so assigned, are, however, smaller than the min for the living species.

None is size a safe contention ^{where} ~~the~~ ^{with} ~~the~~ living species, *J. pacifica*, the overlapping *J. stellata* at its minimum in ^{breadths of} ~~all wing~~ bones and femora. Lengths can be measured only on the two coracoids of ^{a few} ~~one~~ *J. paleodytes* + a femur of *J. concinna*.

Am	9.27
ICA	15.23
M.F	13.09
Qp	16.95
Uln.F.	15.12

Querina is generally

Gavia

~~that~~ *Q. pacifica*

Not is size reliable when the elements are ~~not~~ different.
In living species, ^{altho} ~~the humeri of~~ *Q. pac.* averages larger
than ~~in~~ *Q. stellata* in humeri, the reverse is true
of the tarsometatarsi. ~~Comparing~~ *Querina*

In size *Q. concinna* is said to be larger than *Q. pac.*
& *stellata* but smaller than ^{altho min. specimens do overlap the max of} *Q. pac.* in some
dimensions.

lies at the opposite extreme, ~~the humeral breadth~~ ^{dipal}

barely overlapping ^{two} *Q.* the smaller species in humeral breadth.

All ^{specimens referred to} *Q. paludipes* appear to fall within the size range of
Q. pacifica. The oceanside tarsus also is ~~not~~
within the *Q. pac.* range. ~~altho its size supports~~
~~of close closest~~ possible alignment with *paludipes*,
it cannot be considered definite. In living species, for
example, ~~very~~ *Q. pac.* averages larger than *stellata* in the humeri,
but the reverse is true of the tarsometatarsi.

On the basis of size, The ^{oceanside} *tarsometatarsi* conform ^{not}
closely with *Q. paludipes*, in that ^{near} all dimensions fall within
the size range of medium *Q. pacifica*, as is true, as well,
of ^{humeral breadth} *Q. paludipes*. However, as *Q. concinna* & *Q. howardae*
also overlap *Q. pac.* at the extremes, and the ^{former}
of *Q. paludipes* is smaller than *Q. pac.* (except for ^{greater length} ~~the humeri~~),
I doubt that size ~~alone is a reliable~~ ^{can be relied upon} criterion is a reliable
involved. Even in the living form the relative size of humeri
to tarsus differs in *Q. pac.* & *Q. stellata*.

In size *Q. concinna* is the largest, *Q. howardae* the smallest, with *Q. paladytes* seemingly in between. ~~Between~~ *Q. concinna* has usually been referred to as between *Q. immer* on the one hand & *Q. stellata* on the other, *Q. howardae*, known only from the distal end of 3 humeri ~~which are~~ smaller than *Q. stellata*.

In a series of *Q. pacifica* at hand, I find the humeri ~~which is~~ ^(#B1305) ~~very similar~~ to *Q. concinna* type. ~~the dimensions of the humeri are similar~~ to those of the *Oceanside* tarsus. It is, therefore, possible that the tarsus represents *Q. concinna*. However, I also find in the *Q. pac.* series, ~~that the br. meas. of the humeri both breadth measurements~~ have a range which includes specimens assigned to *Q. paladytes*. That the minimum size range of the humeri includes specimens.

However, I also find that the humeri of *Q. pac.* are for the most part broader than those ref. to *Q. paladytes*, the range does include *Q. paladytes*.

~~the humeri~~ ~~are~~ ~~equal to~~

However, as there are ^{coarctoids, femora +} humeri within the *Q. pac.* series that are as small as those ref. to *Q. paladytes*, ~~it is possible that the~~ ~~could be one~~ also a possibility.

The *concinna* femur also is ~~equal~~ exceeded in length by 305 *Q. pac.* but *concinna* is markedly heavier than any *pac.*

Even size is not a clear cut factor, though *Q. concinna* is purported to be larger than between *Q. stellata* + *Q. pac.* on the one hand + *Q. unimex* on the other, the type *Q. pac.* is equalled in size by a ^{max} specimen of *Q. pac.* in the LACM collections. *Q. paleodytes* also falls within the size range of *Q. pac.* And even the type humerus of *Q. howardae* is no smaller than the ^{max} specimen of *Q. pac.* in some ^{meas.} of breadth.

I find within the series of *Q. pac.* skeletons in the LACM coll., specimens equivalent in size to ^{the type} of both *Q. concinna* + *Q. paleodytes* + even one (min.) skeleton in which ~~the humerus~~ contains humeral dimensions as small as those of the type of *Q. howardae*. ~~Q. concinna~~ ^{is included} ~~these series are tarsometatarsi~~ ^{are approx.} ~~the tarsometatarsi are also conform to certain meas.~~ of *Q. pac.* Also within the *Q. pac.* series are tarsometatarsi which conform in certain meas. with the ~~Q. concinna~~ ^{presumably} tarsus.

Even size is not a clear cut factor, altho *Q. concinna* is presumably the largest of the 3 species + *Q. howardae* the smallest,

Altho on the basis of the elements previously studied *Q. concinna* is presumably the largest + *Q. howardae* the smallest of the 3 sp., these proportions do not necessarily hold for the tarsometatarsi. As a matter of fact, in a series of skeletons of *Q. pac.* at LACM I find ^{a max} specimens equal in size to the type ~~of~~ *Q. concinna* and ~~an average~~ ^{an average} tarsometatarsus close to the ~~Q. concinna~~ ^{Q. concinna} tarsometatarsus, as well as other elements which agree in br. dimensions with those cited for *Q. paleodytes*. ~~I do not find that~~ *Q. howardae* is known only from humeri

Gavia 305 (pac) matches in size the type of *G. concinna*

	^{fairer} Pac. 305	^{fairer} Pac. 28
oceanic fossil		
69.5	length 75.7	69.4
3.7	br sh 4.0	3.6
12.1	br max 12.9	11.9

G. humilis *G. howardae* 11.9 - 12.7, ^{least} 13.6 (type) *G.* 13.1

1020 *G. stellata* 13.2

327 " " 13.0

788 *G. pac* 13.1 -

305 *G. pac* 15.8 -

306 " " 15.1 -

28 " " 15.3 -

673 *G. pac* 13.1 -

328 *G. stell.* 14.0

G. humilis length 40.9 Pac. 306

br 5.5

max 13.5

dist 14.0

41.1 Pac 304

5.4

13.3

14.1

44.3 Pac 305

6.0

15.0

15.5

40.3 Pac 673

4.2

12.7

13.3

Gavia pallidus from Bradhol
p242
1953

39.2

5.0

12.7

13.1

min 53.6

7.3

18.5

17.8

Class Aves
Order Saviiformes, Loons
Family Saviidae
Gavia sp.

Gavia Foster 1788
Gavia sp.

A single tarsometatarsus (no. 88656) represents a loon of a size presumably close to moderns of both Gavia stellata and G. arctica ^{these} pacifica. Characters of this element are variable within living species and it is difficult to point with assurance to any differences which can be relied upon to separate them. Including the larger G. immer ~~under consideration~~, there are two possible areas of distinction that appear reasonably constant: 1. The hypotarsus is more markedly inset from the external edge of the shaft in G. immer and G. arctica than in G. stellata; 2. the internal side of the shaft narrows in depth toward the proximal end in G. immer, and there is a tendency to this condition, also, in G. arctica;

^{Whereas} in G. stellata the internal face of the shaft has straighter anterior and posterior margins. The fossil is distinguished from G. stellata in both of these ^{about} characters; the proximal narrowing of the internal face of the shaft is more abrupt even than in G. immer, particularly on the anterior margin. Another character of the fossil, which is not duplicated in any modern specimen at hand, is the high posterior position of the distal foramen, its proximal border being near the level of the proximal edge of the internal trochlea and 6.7 mm above the external intertrochlear notch. In ~~the~~ living species, the ^{posterior} proximal border of the ^{distal} foramen is well below the proximal level of the internal trochlea and only 3.8-5.0 mm. above the notch in G. arctica and G. stellata. Even in the largest available specimen of G. immer, the posterior height of the foramen is only 6.3 mm above the notch. ^{Particularly in view of the Mid Pliocene age of the fossil} In view of these characters ~~and the Middle Pliocene age of the fossil~~, ^{strongly suggest that} the specimen ~~undoubtedly~~ represents an extinct species. ^{is represented}

On the basis of size *Q. concinna*, ^{however} appears to have been markedly larger than

On the basis of size, however, *Q. concinna* can be ruled out.

~~The *Q. concinna* appears to have been a larger form than either of the other species. The type also is said to be intermediate in size between *Q. unna* & *Q. stellata*.~~

~~According to meas. made in ^{Paris} of *Q. a. pac.*~~

~~the ^{br.} *Q. a. pac.* given ^{for the type of *Q. a. pac.*} ^{are} ^{very} close with~~

Foss. of a max. spec. of *Q. a. pac.* in LACM coll. Ref. humeri slightly exceed *Q. a. pac.* in breadth. Anaf.

femur is the only element for which a meas. of length is possible. HOW COMPARE IMMER & PAC?

A femur of *Q. paladyti* is only 3.5 mm shorter than that of *Q. concinna* is ^a much more delicate bone.

Only humeri of *Q. howardae* are known. ^{in all meas 1 br. ex all} ^{for them} the epicondyles, they are clearly smaller than those of *Q. paladyti*.

10.159.306
409
290
8
1011880
18
117)920
036.82
124)10218
992
280

691620
563
580
9
711680
639
440

★ Compare lengths of femora with *stellata* & *pacifica*

^{Miocene and Gavia brodkorbi Miocene - very small}
Gavia continued + ^{Gavia} ~~Gavia~~ ^{Calvert fm. Maryland smaller than immer}

^{Tertiary} Three extinct species of loons have been described from the ^{Middle + late Pliocene} Pliocene of North America: Gavia concinna from the (Etchegoin and San Diego formations) of California and the ^{Middle Pliocene} (Bone Valley formation) of Florida, G. paleodytes also from the Bone Valley formation, and G. howardae from the San Diego formation in California, ^{and Gavia brodkorbi from the late Miocene, Monte} The tarsometatarsus ^{Calif. (Hans) 1938} is not known in any of these species and the qualitative characters defined for the humerus (which is the only element recorded for all three) do not provide a firm basis for determination of the specimen at hand.

In the descriptions of the fossil species, broad references are made to size in comparison to modern species: G. concinna between G. immer on the one hand and G. stellata and G. pacifica (arctica) on the other; G. paleodytes a "small species about the size of the red-throated loon G. stellata" (Brodkorb, 1955:5); G. howardae smaller in size than G. paleodytes. (loc. cit.) Comparing the measurements given with comparable measurements ~~measurements~~ on a series of modern skeletons in the LACM collections, we find that these generalities will not suffice for placement of the tarsometatarsus at hand. We find, for example, that compared with the LACM series of modern skeletons, ^{the humerus of} G. paleodytes tallies more closely ^{in size} with G. a. pacifica than with G. stellata (see table). We also find that the tarsometatarsi of G. a. pacifica and G. stellata tend to be more nearly equal in size than is the case with the humeri (tables 1 and 2). Tarsometatarsus 88656 is shorter than any specimen of G. stellata at hand, but falls within the range of G. a. pacifica; shaft breadth, however, which is also within the range for G. a. pacifica, is greater than in G. stellata. On the basis of size the tarsometatarsus might belong with either G. paleodytes or G. howardae. Purely on geographic grounds, G. howardae would be the choice; on the other hand, geologic age would favor placement with G. paleodytes. It must be conceded, however, that still another species may be represented. Hence, we decline to assign the specimen.

A single *Quadracanthus* (no. 88656) represents a lion which falls within the size range of both *Q. a. pacifica* & *Q. stellata*. Characters of this element are variable within the living species and it is difficult to point with assurance to any differences which can be relied upon to separate them. Two areas of distinction ~~the~~ appear reasonably constant in the specimens at hand (5 of *Q. a. pacifica*, 4 of *Q. stellata*, 3 *Q. immer*)

- ① ^{The} *Hypotaenidia* is more markedly inset from ^{the} external edge of shaft in *Q. a. pacifica* & *Q. immer* as contrasted with *Q. stellata*.
- ② ^{The} internal side of shaft ^{is} narrower in depth toward proximal end in *Q. immer* with tendency to this condition also in *Q. a. pacifica*; *Q. stellata* ^{however is} generally straighter in both anterior & posterior borders of ^{the} internal side of shaft. The fossil is distinguished from *Q. stellata* in both of these characters, and ~~is~~ ^{the proximal} narrowing of the internal face of the shaft is more abrupt ^{than} in *Q. immer*, particularly on the anterior margin. ~~The distal notch is a shallow concave in the prox. part of the shaft.~~

Another character of the fossil which is not duplicated in any modern species at hand is the ^{position} very high position of the distal foramen, ^{its prox. border} being ^{near the level of the prox. edge of} the internal trochlea and 6.7 mm above the ^{ext.} intertrochlear space notch. In the living species the prox. border of the foramen is ^{well below prox} ~~near~~ the level of the ~~center~~ ^{prox. border} of the int. trochlea and ~~even~~ in *Q. ~~immer~~ arctica* 3.8-5.0 mm, *Q. stellata* ~~4.5-5.0 mm~~ from the ^{prox} intertrochlear notch. Even the largest *Q. immer* avail. the ^{ht} of the foramen above the notch is only 6.3 mm.

Javia ~~parvica~~

A tarsometatarsus (no 88656) broken through the calcaneal ridge & somewhat eroded distally agrees in size and general characters with Recent specimens of J. stellata & J. pacifica (1928) I have previously indicated that the tarsometatarsi of these two species are indistinguishable. With additional material now before me I find the following characters appear to be constant:

- ① ~~Proximal border of shaft adjacent to hypotarsus separated from hypotarsus by deeper groove~~
- ① Hypotarsus more medially inset from lines bordering ext & int. edges of shaft; ② depth of internal side of shaft ^{tending to be} more noticeably narrowed at level of distal edge of hypotarsus (ratio of ^{depth} breadth here to greatest depth at center of shaft 70-77% J. pacifica, 81-86% J. stellata)

J. paleodytes type ceratoid = size of pinhead - smallest Javia humerus
Length from foramen to distal end 26.1 mm
narrowest diam. shaft - 6.8 mm -

Dist Breadth humeri paleodytes (Buddhabapat) 14.3 three epicondyles
11.7 " condyles

J. concinna type ulna between imma & stellata in size (approaches imma)
"dist" depth shaft of Buddhabapat specimen of ulna 7.6, least br. shaft 5.3
Type br. prox end. 11.7 mm, least br. sh. center 5.8

Dist breadth humerus (Buddhabapat) 15.5-16.7 (epicondyles) ^{three}
12.5-13.1 (condyles)

Buddhabapat says humerus resembles chairs. imma
H says mandibles chairs like stellata

Modern per H. imma
pal. 14.1 dist 12.1
smallest three mean unit
be three epicondyles

J. howardae type dist end humerus br (three epicondyles) 12.0-14.4
condyles 9.2-10.2
Said to be smaller than J. paleodytes

H. meas. of humeri assigned by Buddhabapat & howardae

" " " stellata same paper as above
" " " pacificus
Budd. meas " " J. concinna (three condyles) → 12.5-13.1

→ Budd. meas " " J. paleodytes " " → 11.7

" later 1953 " " J. paleodytes " " 11.7-12.4 2nd largest

" " 1955 " " J. concinna " " 12.5-13.1 largest

" later 1955 " " J. howardae " " 9.2-10.2 smallest

Even size is not a clear cut factor. Although
on the basis of elements previously studied, *Q. concinna*
is noted as the largest, and *Q. howardae* the smallest
of the Three species, these relative proportions may
not necessarily hold for the tarsometatarsi. I note,
for example, in a series of skeletons of *Q. pac.* &
Q. stellata in the LACM collections that although
the humeri of *Q. stellata* average 5% ^{shorter} ~~smaller~~ than those
of *Q. pac.* ^(within same range) the tarsometatarsi ^{from the same skeletons} not only average ^{longer} ~~shorter~~
there but even the min. specimen is 3 mm longer than the
min. for *Q. pac.* ~~This fact coupled with the discovery that~~
I also find that the types of all three ~~of~~ previously described sps. and
the tarsometatarsi now in hand can all be matched
in ~~some dimensions~~ within the series of *Q. pac.*
skeletons. See table.

* meas by me on type
xx " " by Brindley & Mithun
humerus

q. Br. dist end

ulna
br. prox.

coracoid
length from
to sternal end

+ also
length

BA V, A
in
prox

type
harvard* 13.1

paludicola** 14.3-14.7

concinna** 15.5-16.7

11.7

Q. pac. 13.8-15.8, M 15.2

9.9-11.7 M 11.0

Q. stell. 14.0-14.6 M 14.3

10.0-10.6 M 10.2

Q. minor 17.8-19.5?

12.6-14.5

Oceanodip.

66.9-75.8 (70.3) 11.4-12.6 M 11.8

70.0-72.2 (71.2) 11.3-12.0 M 11.8

81.7-91.3 14.0-15.6

64.5 12.0 12.0

pacifica
coracoid 305 L 28.1 4.6
R 28.2 4.7

473 L R 26.0 5.5

306 R 24.2 5.8

L 25.0 5.0

stellata 28 L 23.2 6.3
R 24.0 6.8

788 L 21.5 5.0

(21.3) 5.1

377 R 21.3 5.5

(21.5) 5.4

minor 830 R 36.4 9.2

L 35.7 8.8

761 L 30.7 7.4

R 31.1 7.6

ORDER PROCELLARIIFORMES

Family Diomedidae -- Albatrosses

Genus Diomedea Linnaeus 1758

Diomedea sp.

Referred specimen.-- LACM 119353, distal end of left tibiotarsus, from locality LACM 4297, collected March 9, 1979.

Discussion.-- LACM 119353 resembles the tibiotarsus of the Recent Black-footed Albatross, Diomedea nigripes Audubon 1839, in the rounded contour of the external condyle (viewed laterally) and slight notch in the distal surface of the internal condyle.

However, the fossil is narrower in the area of the ligamental bridge and is about 8 per cent smaller in [over-all] breadth of the distal end.

Three fossil species of Diomedea have been described:

Diomedea anglica Lydekker 1891, from the Early Pleistocene and Late Pliocene of England and the Early Pliocene of Florida (see Brodkorb 1963:242); D. milleri Howard 1966 from the Middle Miocene, Sharktooth Hill Bonebed in Kern County, California; and D. californica Miller 1962 from the Sharktooth Hill Bonebed and, tentatively, (Howard 1978), from locality LACM 6906 in the Late Miocene, Monterey Formation in Orange County, California. A tarsometatarsal shaft of Diomedea sp., close in size to that of D. nigripes, also has been recorded (Howard 1968) from a slightly earlier facies of the Monterey Formation (LACM locality 1945) in Orange County. The Orange County specimen of D. ?californica and the Florida specimen of D. anglicae tibiotarsi; both are markedly larger than LACM 119353 from the San Mateo Formation. The holotype proximal end of an ulna ~~is the only recorded specimen of D. milleri~~ is the only recorded specimen of D. milleri. It is even smaller in proportion to the comparable element of D. nigripes than is the tibiotarsus from locality LACM 4297.

May 81
from
material given to
Carry for our
combined paper
March 1981

revisit
so as not to be
exactly like
Barnes et al.
see Diomedea from 20-20

D. albatrus?

Diomedea sp.

From the comparable element of the
but resembles that recent species in the rounded contour of the distal condyle
in the distal end
of the ulna.

from
albatrus
bones are
known from a
series of 4
localities
from 10 to 15
miles from
San Jose.

based on a
tarsometatarsus

As Thylidactylus Wilkinson 1969, from the Miocene of Australia;

Loc 4287

called by
McKenzie
March 9, 1979

$$\begin{array}{r} 100 \\ 20.6 \overline{) 136.0} \\ \underline{123.6} \\ 12.40 \end{array}$$
$$\begin{array}{r} 8 \\ 177 \overline{) 1470} \\ \underline{1416} \end{array}$$

Family Diomedeidae - Shearwaters

Gen Diomedea Linn. 1958

Dittonda Ma

Referred specimen. - LACM 119353, ~~left~~ distal end of
left tibiotarsus, from locality 4297 collected by R. H. M. & J. S.
Mondy 9, 1979.

Discussion. -- The specimen has the ~~distal~~ ^{containing} rounded
Anat. of *D. nigripes* Audubon 1839 in the rounded ~~shape~~ ^{containing} the
external condyle (viewed laterally) and the slight notch
in the distal ~~surface~~ ^{of the} internal condyle. However, it ~~narrower~~
It is, however, about 10% smaller ⁱⁿ the ligamental
bud, and is about 10% smaller ⁱⁿ the ligamental
bud, 1. ~~slightly different in placement~~
Dissimilis *Dissimilis* ~~prevalent~~ ^{prevalent} ~~displays~~
1966?

~~of the two species of *Dinmedia* prevail~~
~~Three sp. of *Dinmedia* have been previously~~
~~described *D. calif.* Miller 1962 & *D. muller* Howard 1966~~
~~from the Middle Devonian Sharktooth Hill, Kern Co., Calif.,~~
~~and *D. anglica* described from the Reg. Cras Pleistocene~~
~~of England, and listed also (see Burdick 1963: 242)~~
~~from the Pliocene of England and Florida.~~
~~The *D. muller* is possible~~
~~same form~~

~~The following are from various~~

~~The following from Occurrence~~

~~Of these 3 sp., only D. milleri is of a size poss.~~

~~A few species, only D. milleri is of a size poss.~~

~~D. angust + D. call are both large species, D.~~

~~milleri, known only from a prox end of ulna is about~~

~~20% smaller than so small, or even smaller in~~

~~pupation E. D. mifer than the accounts told~~

37629
6906

San Mateo

Alcinoe —

Uma, Aethia

and Capellus

✓ *Wing phalaris* of Uria 88704 vs D2, Ph 2

Got from Velders

✓ Woodford, A.O., 1925. The San Onofre Breccia: its nature and origin. Calif. Univ. Rept. Geol. Sci. Bull. 15(7): 159-280.

✓ Olson, Storrs L. and David P. Gillette, 1978. Catalogue of type specimens of fossil vertebrates Academy of Natural Sciences, Philadelphia, Part II: Birds. Proc. Acad Nat Sci Philadelphia 129(7): 99-100

Cathartes antiquus ^{mark 1870}
probably identical to
Australis (P. 100)

✓ Howard, Hilda, 1978. Late Miocene marine birds from Orange County, California. Nat. Hist. Mus. of Los Angeles County Contrib. Sci. # 290, 26 pp.

✓ 1968. Tertiary birds from Laguna Hills, Orange County, California. LACM Contrib Sci. no. 142, 21 pp.

✓ 1976. A new species of flightless duck from the Miocene of California (Alcedae; mancallinae). In Collected Papers in Avian Paleontology. Honoring the 90th Birthday of Alexander Wetmore. Storrs L. Olson Ed. Smith Contrib. Paleobiol. no. 27: 141-146

✓ 1970 A review of the extinct avian genus, Mancalla. LACM contrib Sci. # 203, 12 pp.

✓ 1971. Pleistocene avian remains from Baja California. LACM Contrib. Sci. no. 217, 17 pp.

✓ 1966. A possible ancestor of the Lucas Creek (Family mancallidae) from the Tertiary of Orange County, California. LACM contrib Sci. no. 101, 8 pp.

✓ Kohl, Roy F. 1974. A new Pleistocene fauna from Humboldt County, California. Sh. Veliger 17(2): 211-219.

See other side

Uria new species

Holotype: Incomplete skeleton including complete left and distal right ulnae, sternal ends of left and right coracoids, distal left and right ~~radii~~ ^{humeri}, right articular end scapula, and distal end of ^{left} Carpometacarpus, UCMP no. 88704 from UCMP locality V68147, Lawrence Canyon, near Oceanside, California.

Formation and Age: San Mateo Formation; Late Miocene-Early Pliocene.

Description: Attachment for anterior articular ligament *of olecranon broad*
 oval ~~as in Uria~~; olecranon well developed ~~and~~ anconally and hooked
 towards internal side; shaft rounded -- *less blade like than* ~~xxxxxxxxxxxxxxxxxxxx~~ *Uria*
~~less flat laterally. compared to~~ *than in Uria* ratio br to depth 73% *Uria 61-65%*
 Attachment
 for anterior articular ligament pointed in *Lunda* and *Fratercula*,
 short and round in *Cerorhinca*; olecranon shorter and less hooked in
Lunda and *Fratercula*;

Measurements: Greatest length 62.6 mm, br. proximal end 8.6 mm, depth proximal end 9.8 mm, greatest distal dimension (diagonally) 8.3mm; ahaft dimensions 3.8 mm breadth x 5.2 mm depth (br. 73% of depth); (Uria. 61-65%; Lunda 61.9%, Fratercula ~~60%~~ 68 %, Alca torda 60%)

CORACOID Resembles Uria in coracoid femestra a complete perforation situated about midway between procoracoid and shaft. The perforation is complete also in Fratercula and Lunda, but is more towards the sternal end. The perforation is about the same, also in Synthliboramphus and Endomychura as in the fossil and in Uria. Pinguinis has the complete perforation But the ^{internal} distal angle of the coracoid is greatly attenuated' the foramen is also midway in Alca, but the distal end/sternal facet is broader laterally and deep anteroposterirly. In fossil sternal end expanded laterally, sternal facet narrow antero- osteriorly as in Uria

Measurements; sternal endge to glenoid facet posteriorly 23.5^{left} mm
23.0 rt.
greatest depth sternal facet 4.3^{left} (4.5 right).

SCAPULA: Although the scapula is concave dorsally between the glenoid facet and the acromion, it is more so than in *Uria aalge* or *U. lomvia*. It differs further from *Uria* in longer glenoid facet, with more rounded contour, less projecting (narrower); acromion extending farther along shaft and of greater dorsoventral dimension than *Uria* (Lunda and Fratercul even less extended than *Uria*. The rounded, less projected contour of the glenoid facet resembles the condition in *Cephus columa*, but *Cephus* is not concave dorsally, nor is the acromion as well developed. The fossil lacks the triangular depression below the acromion dorsally, characteristic of *Uria*.

Radius: Too poorly preserved to observe detailed characters, other than to note the presence of two ridges on the anconal side of the distal end as in *Uria* (only one ridge in *Fratercula* and *Lunda*).

Measurements: Breadth distal end 5.7 mm, depth ~~xx~~ 2.2 (same dimensions in *Uria* aagle, 5.8 and 2.7 mm)

CARPOMECARPUS: Measurements br x depth distal facet of digit 2, 4.4 x 3.8 (115%), *Uria* 4.4 x 3.8 (aagle 118%, *Lunda* 4.2 x 3.6 (116%) depth through facets for digits 2 and 3, 5.5 mm, *U.* aagle 5.8, *L. lomvia* 5.3, *Lunda* 5.4

Measurements of scapula: Proximal breadth 10.6 (*U.* aagle 11.3, *U. lomvia* 11.1, *Lunda* 11.1, *Fratercula* 10.1); breadth shaft 4.3 (aagle 5.0, *lomvia* 4.4, *Lunda* 4.4, *Frat.* 4.9); depth acromion 3.8, (aagle 3.2, *lomvia* 3.25, *Lunda* 2.2, *Frat.* 1.7), breadth glenoid facet 3.6, aagle 4.0, *lomvia* 4.0, *Lunda* ~~xx~~ 4.0, *Frat.* 3.7)

16

cond ✓

Measurements.-- Length to internal condyle 61.6 mm; breadth of proximal end from external to internal tuberosities 14.7 mm; breadth of proximal end from external tuberosity to bicipital crest 15.4 mm; breadth of distal condyles 7.1 mm; greatest breadth of distal end 9.4 mm; distance from external condyle to proximal tip of ectepicondylar process 8.2 mm; least breadth of shaft ^{3.7}3.7 mm; greatest depth of shaft 4.9 mm; length of pectoral attachment 7.5 mm; breadth of pectoral attachment 3.8 mm.

See Table II for comparison with C. columbianus.
Discussion.-- The genus Cepphus was tentatively recorded from locality LACM 6906 in the Late Miocene Monterey Formation of Orange County (Howard, 1978:21). While the specimen, an ulna (LACM 47045), suggests a species comparable in size to Cepphus olsoni here described on the basis of the humerus, there is no clear indication that the two elements represent the same species. Apart from these two specimens, there is no other fossil record of the genus Cepphus. According to Storrs Olson (pers. comm.) Cepphus ~~has not been found in~~ the abundant material of Alcidae known from the Miocene and Pliocene of the western Atlantic.

That Cepphus olsoni is in no way related to Miocepheus mcclungi Wetmore 1940 from the Miocene Calvert Formation of Maryland, is evident from the illustration of the holotype humerus of the latter species (Wetmore 1940:36, figs. 11 and 12) as well as the shaft measurements supplied. The shaft in Miocepheus is more laterally compressed, the ectepicondylar process more prominent proximally, the pectoral attachment more elliptical. These observations are in keeping with an opinion previously provided by Storrs Olson (Howard, 1978:21), that he finds Miocepheus to be more closely related to Uria and Alca than to Cepphus.

Austalia concolor has very deep (anteriorly)
Stemal facet. Facet is narrow (5 long laterally) in Males
Concolor & diegensis

v = returned 4, 19, 79

22 March 1979

Museum property to be checked out by Gretchen Sibley for Dr. Hildegard Howard.
Compiled by Robert McKenzie.

Mancalla from Oceanside locality 4301:

- ✓ { 119165 - left humerus
119166 - partial right humerus
119167 - distal right humerus
119168 - distal left humerus
119169 - distal left humerus
119170 - humerus shaft
119171 - proximal left humerus
119172 - left scapula
119173 - distal left tibiotarsus
119174 - shaft of left tarsometatarsus
- ✓ { 119222 r 119224 humeri
119223 coracoid

Mancalla form San Diego

- ✓ { 104279 - left humerus ✓ 2067 coracoid
2304 - right humerus
2178 - tarsometatarsus

✓ Mancalla from Newport

- 2577 - distal humerus

Premancalla form Oceanside

- ✓ 107028 - tarsometatarsus
✓ 107029 - humerus

Mancalla cedrosensis

- ✓ 15367 - humerus
✓ 15373 - coracoid = type skel.

- ✓ Uria 52108 humerus
Laguna Niguel

Character which place specimens in Uria

Coracoid; procoracoid well developed, extending about $\frac{1}{2}$ the distance from lower edge of scapular facet to ^{posterior} glenoid fossa, foramen well formed, glenoid facet ^{well} developed

Ulna; Olecranon short & pointed, brachial impression long, length approximately $\frac{1}{4}$ of linear dimension from int. angle to distal end, palmar border not extending beyond extensor surface of rapt. ~~Contour of internal angle~~ attachment of ant. ant. lig. oral.

Procoracoid - rules out

Brachyramphus - no foramen

Ptychoramphus " "

Cephus notch

Actinotus no foramen

Cyclorhynchus " "

Cerorhinca very long + foramen low

Lunda very long " " "

Possible relationships

? Pringuis (more blunt olecranon? narrow brachial, small ant. ant. lig. ^{round int. angle})

Alca (ulna with long curved olecranon + triangular lig. attach)
brachial impression very narrow

✓ Uria

Syphilarhamphus (round glenoid however) long olecranon

Eudomychura (ulna with long pointed olecranon)

check breadth brachial impression in Lunda

Uria

Differentiating characters: Scapula with longer (longit.) acromion and narrower, less inflated glenoid facet; thicker shaft. Intermuscular line on anterior face above sternal end and at first from external edge more markedly. Tricipital attachment on ulna more deeply notched even than in *C. lomvia*. All bones shorter than in *C. lomvia* + relatively stockier.

gr. length 62.6 gr. diameter dist 8.3 (dist. approx)
 to anterior edge of cap 61.8
 Pers. br 8.2
 pers. depth 9.8

Store groups given
as follows:

Uria - Uria 88708 from 168147

Surface Attachment for act. cut. lig. broad ^{relatively flat} & point directed slightly anteriorly (anterior to ridge of brachial impression).
~~No much depression act. attach. & cut. cotyle.~~
In U. aalge this surface is narrower, rounded at bottom & more depressed.

Portion more as in U. lomvia, but longer, ~~is~~ is more depressed below cotyle.

In the coracoid the furcular facet ends upward ^{protrudes} as in U. lomvia but is rounded in U. aalge.

Humeral length for previously described Murres
(Stores, UC Pub. Zool. 152 (2) 184 'a comparison of
variation, behaviour, & so on, in the sea bird genus
Uria & Cepphus' (TITLE)

Mio?	Uria antigonus	Marsh type humus	96.2 mm	+ mentions Lamhihto Uria from 2 Plus sites in Italy U. aurora Pott U. sp. Regalia
Plum?	" affinis	"	95.0 mm	
	U. aalge	humus	84-91.5	
	U. lomvia	humus	87-94.	

Uria lomvia B/1855, 5 elements

Alca torda B/1857 coracoid, 1849 coracoid, ulna, carpus

U. aalge Longbeach 3321, coracoid R+L, carpus L, ulna L, scap R, radius

Archaeopteryx lithuanica coracoids - lomvia

Eudomyzura crassirostris
1665, 1132, 664

1825 Eudomyzura hypoleuca 561, 667

Uria aalge calif. LACM 477, 494, 517, 674, 697

Quadrant archata 696

Hadronota 800

Synthlibramphus antipus 532, 687

San Mateo cont'd

UCMP 88204 cont'd

Radius (dist end left + rt. - Right in better shape, left broken on anterior surf. of dist end)

For dist end - 5.7 U. aalse 5.8
Depth " facet 2.2 2.7 4.6 5.9
38.5 90

The 2nd ridge on the anterior side in Uria is indicated in the fossil but has been broken (only 1 ridge in Exelatus + Lunda)

Right scapula - articular end

fossil	protr. 10.6	U. aalse 11.3	U. Lunda 11.1	Lunda 11.4	Latitula 10.1
Sh. br.	4.3	U. aalse 5.0	U. Lunda 4.4	" 4.4	" 4.8
length facet 5.6 6.7	U. aalse 5.2	U. Lunda 4.9	" 5.8	" 4.8	" 4.8
depth in acromion 3.8	U. aalse 3.2	U. Lunda 3.25	" 2.2	" 1.7	" 3.7
on glenoid facet 3.4	U. aalse 4.0	U. Lunda 4.0	" 4.0	" 3.7	" 3.7

Concave dorsally between glenoid facet and acromion (more than in U. aalse)
glenoid facet longer than in Uria, more rounded contour, less projection (narrower glenoid)
acromion extends farther along shaft + of greater dorsoventral dimension than Uria
(Lunda + Latitula even smaller than Uria)

The rounded less projected contour of the glenoid facet resembles the condition in Cephus columba, but Cephus is not as concave dorsally nor is the acromion as well developed
Fossil lacks the triangular depression below the acromion dorsally char. of Uria

Left coracometacarpus - frag. dist. end

4.4 x 3.8 br x depth dist. facet Dq. II	U. aalse 4.5 x 3.8	U. Lunda 4.2 x 3.2	4.2 x 3.6 Lunda
5.2 depth through facets for digit II + III	" 5.8	" 5.3	5.4

	blue shag	as	dimension	height	c	int	x y	x a	x b	x c	y a
Alaska	4.4 x 6.7	68.6	69.7	8.0	8.8	10.2	46.5%	6.3	8.8	5.0	9.6
1885	3.6 x 5.8	62.0	68.2	4.4	7.9	9.5	43.0	5.3	8.2	4.5	8.5
Alaska	3.8 x 5.9	64.4	68.3	4.6	8.3	10.2	64.5	5.5	8.2	4.5	8.6
11	4.8 x 7.3	65.7	68.8	5.3	9.1	10.4	65.8	7.0	9.0	5.2	10.6
477	4.3 x 6.5	68.1	68.4								
3321	3.8 x 5.6	67.8	61.4	4.4	8.0	10.0	68	6.2	8.6	4.7	9.1
697	4.2 x 6.0	70.0	65.7	4.8	8.4	10.1	70	6.4	8.7	5.0	9.1
494	4.2 x 6.4	65.6	69.5	4.7	8.2	10.4	65.5	6.0	8.9	5.1	9.2
507	3.9 x 6.2	62.9	67.5	4.5	8.0	10.2	63	5.7	8.6	4.8	9.2
480	3.9 x 5.9	66.1	62.5								
485	3.8 x 5.7	66.4	64.7								
Oregon	3.9 x 5.2	64.9	62.5	4.7	8.3	9.8	75.7%	6.2	8.3	4.7	8.3
Isle											

Siuda
curvata 3.6 x 5.65
Cold Springs

63.92%

C. linnii 3.6 x 5.7 63.1% 68.2
1885
near 1979

See meas. over

(UCMP 58704)

The following elements assignable to *Uria* were found together at locality V 68147: right & left coracoids (lower portion only), complete ^{right scapula} left ^{ulna} & distal ^{1/4} right ulna; right and left distal ends radii, distal end left carpo-metacarpus & a wing phalanx.

~~Distinguishing characters~~ Even between the 2 living species, *Uria aalge* & *Uria lomvia*, distinguishing characters are difficult to discern. Storer 1952 pp. 156 & 178 ^{shows *U. lomvia* are slightly larger.} Compares ~~these 2 sp. for size~~ ^{wing length & tarsal length} for these sp. (*U. aalge* 289-234 wing length varying geographically; *U. lomvia* wing length 204-240 & tarsal length *U. aalge* 32.5-41.5, *U. lomvia* 30.5-41.0 ^{33.0} (largest in Calif., smallest in Britain) smallest in Gulf of Bay, (largest in Kamchatka))

	fossil	1855 lomvia	aalge											
ulna length	42.4	68.2	61.3	65.3	65.7	67.5	69.4							
ray (coracoid)	8.3	7.9	8.1	8.4	8.4	8.2	8.3							
Int. depth	9.8	9.5	10.0	9.9	9.8	10.2	10.3							
Coracoid length to scap. facet	25.3	27.0	28.1	28.4	29.7	29.4 (2)	30.2	30.9	30.7	25.0	27.2	27.3	27.4	28.5

~~The scapula facet is less~~ ^{longer narrower and} ~~The glenoid facet of the scapula is less abruptly than~~ ^{from the shaft than in *U. aalge* or *U. lomvia*.} ~~from the shaft than in *U. aalge* or *U. lomvia*.~~ ^{But the facet} ~~The shaft relatively narrower & thicker distoventrally~~ ^{the coracoid is broader & flatter than the humerus} ~~The glenoid facet of the coracoid, there is a suggestion of~~ ^{prominence of} ~~this is completed with a deep facet, the scap. suggests distal the~~ ^{humeral} ~~humeral must have had a~~ ^{deep facet} ~~*U. aalge* or *U. lomvia* differ in the shape of the humeral facet, the facet~~ ^{is quite unevenly contoured in *U. aalge*, more even in *U. lomvia*. The} ~~form more nearly resembles *U. lomvia* tho it is shallower & stouter than~~ ^{Anteriorly the humeral facet is 2 ^{earlier} subhumeral ridges} ~~the anterior of which contains a process is more medial in point than in living~~ ^{the humeral is shallower & parallels the center & does not swing to the outer edge.}

Humer 101031 - Two resembling 37666 from Loc 6906

Aetna
pusilla
MVZ
61001

referred *Aetna* sp. and 18949 ref. *A. nasuoni*
Now that this 101031 has the dent and complete the position
is raised as to actual assignment to *Aetna*. In both

A.
pygmaea
MVZ
606299

A. pygmaea = *A. pusilla* ~~these are ^{not} tergites, ^{there is a deep depression}~~
not only under than the ext. groove but is a
is deeply depressed above the distal edge. This is clearly
not the case as seen in the comp. distal end now available.

br. dent
4.5
int. dist 4.5
107031
Sh 20/2.8

Here the int. groove is slightly narrower & has a smooth
surface. All three, however have the papilla. In *pygmaea*
at the tip of the subepimeral process as in *Aetna*, but
this is true, as well of *Cyclorhynchus partacula* 89469

pygmaea
60629
Br. 4.6
depth 5.1

The attachment of the ant. art. lig. (int. distal portion)
is a distinct T slightly cup-shaped (dished-out) in all 3. It has
prominent in *Aetna* but more lateral in position & not cupped &
much closer to *pygmaea* than *pusilla*. Also the shaft is
MVZ 606299

1.9/2.8
Br. dist. sh

37686 from
C906
shape Br. dist.
2.4/3.2

pygmaea is more rounded than in *pusilla* & more like the former

18949 loc
1.7/2.3

Since I find no other genus more closely resembling the
found the 3 *Aetna* were shown for the present. The shape
shape is contour of the shaft anteriorly is similar to *Aetna*

br bet 3 + 4, 6.9 mm

gr. to dorsvent 11.7

br dorsally 8.6 at level of
funeral attack

Next Thursday - May 28:

Also compare *Aethia* with *Cyclorhynchus*
check 2 violet from UCM 68144 (scapula & pedal phal.)

SACRUM
PELVIS

Need more

Concavity of scapula dorsally ? in *V. paluchianus* yes
ventrally ? in *maucella* ? yes

Genus Uria

No form
Brachy
Ptycho
Altra
Cylo

Incomplete wing - shoulder bones ~~used~~ for an alcid
were found together at loc. UCM P 868147. The coracoid combines
~~the~~ prominent ^{point} ~~process~~ ^{point} ~~with~~ well-formed pectoral
with narrow sternal facet characteristic of Uria &
Eudromyces. The ulna has the prominent, heavy olecranon
with ~~separated~~ ^{from} the styloid deep channel between it &
the coracoid rim as viewed externally - a character
typical of Uria, also resembling Uria in the long not
ligamentous attachment. ~~Neither of these characters is present~~
in Eudromyces. The ulna in Eudromyces ~~has~~ ^{Alca} has a
more slender olecranon with no distinct channel between it
& the coracoid & the lig. attach is short & broad in Eudromyces. ^{the angle}
The scapula has a ~~more~~ narrower less protruded
glenoid facet than in Uria and the dorsal surface is
more concave. The concavity suggests Alca, the shape of the
glenoid facet Eudromyces. The ? process is longer than
in any of the genera though in dorso-ventral depth it is close to
Uria. Possibly a distinct ~~species~~ genus is represented.
For the present, however, lacking the more distinctive elements
such as the humerus or skull I have chosen to describe
it only as a new sp. assigned - somewhat dubitantly &
the genus Uria. The radius ^{shaft} has a broad ~~ulnar~~ surface &
a distinct round lig. attachment on the int. side above the distal end
as in Uria. The shaft is narrower the attach a thin ridge in Alca
& the shape very euphratic in Eudromyces.

Alca &
Eudromyces both have
more compressed
shaft.

Re: femur 95118 from 168145

Compare to femur San Diego Soc. N. Hist. 21101

length 66.8, dist 61.4

6.3 x 6.8 br./depth sh. middle
5.3 x 6.4

#95118 66 inc

" " 13.1

Coracoid

Foramen

narrow sternal facet

Endomyclura

(Synscleroneurum BUT

processes convex in center
+ slopes down)

Procoracoid prominent +

ends in pointed tip (radius not cephalic to blunt tip + usually
which is behind of foramen)

The coracoid resembles

Uria + Endomyclura ^{hypholeuca} in this shape, the procoracoid + the narrow sternal
alca has similar procoracoid but sternal facet is deeper
alca also has deeper more cup like scap facet than Uria +
is thus more like the fossil

Ulna

Has less blade like shaft than either Uria or Alca ^{more like} Endomyclura
but resembles Uria in long oval, flattened lig. attachment. set
but is flatter. Lig attach. is short in Endomyclura + significant

The brachial impression extends farther anterior than in Uria
Lig. attach. in Alca ^{trianular (hit down)} raised + stops ~~short~~ well below cotylen edge
goes by line in joint

The long glenoid facet resembles Endomyclura but in the latter the process is shorter than in Uria
Scapula - ~~shape~~ the shape bends ventrally whereas the process is shorter than in Uria

Concavity of dorsal side is suggested in Alca but Alca facet
is broader + shorter + more protruded.

The narrow shaft also resembles Alca

Ulna heavy olecranon with deep space between it + cotylos
as seen from ext side

4.9 x 5.6 glenoid facet of coracoid 119260 from 4300

4.2 x 6.0 same near in Cephus columba 1173

4.8 br thrust scap facet to shape on ventral (ant.) side 119260

4.0 same in C. columba 1173

7.5 from ext edge (shape to tip of procoracoid 119260

7.1 same in C. columba 1173

Note Cephus n. sp. from 4295 is smaller than C. columba 1173

best radius
radius
radius

Radius has distinct round lig. attachment ^{round shaft on ulnar surface +} as in Uria slightly lateral
in placement) Alca just has a wider + ^{thinner} shaft more compressed
Endomyclura has the round attach but shaft is compressed laterally

San Mateo fm

Alcinae

See General fde - Alcidas
~~Gloss~~ ~~del~~ (in cupboards)
~~on Eastern Alcids~~
~~attached~~

Shaft 3.9 x .52
8.3 Ratw 752

3, 8 x 5, 6

3,9 4 6,2

4, 2 4 6, 6

4.2 x 6.2

 4.4×6.7

3.6 y 5.8

3, 8 4 5.9

 $4.8 + 7.3$

444

44.4
17.0
27.4 length to moment from
shear fact?

width sternal facet 17.5

dist. 8.7-9.8 (2 specimens)

radius dist width 5.4

Procorin's
stomach 28, 2 in

28. 2 in

268

Dear Steve -

Alcidae again! This time from
Oceanside, California ~~thought to be San Mateo~~
~~formation (Early Pliocene)~~. But as *Pracuonocalla*
wetmorei is present we are
probably late Miocene in age (as *Pracuonocalla*
wetmorei is present).

~~My particular concern is a partial~~
~~skeleton of a non-mammalian species~~
~~which bears certain similarities to *Uria*.~~
~~When I last discussed the possibility of *Uria*~~

Back in 1976 when I was working
on the material from Laguna Niguel (finally
published March 1978!) you ~~said you would~~
~~found a late Miocene *Uria* from possible~~
~~related to the alca, *Uria* group found~~
~~I thought of describing a late Miocene *Uria* - alca~~
~~form, you would suggest contacting you again~~
~~to contact if any late Mio bones with~~
describing ~~one~~ appeared related to the *Uria* - alca
group. Well at Oceanside there is a partial
skeleton - left + right ulnae, left + right coracoids
(lacking the furcular facet), scapulae, left + right
distal ends radii, + a scapula, dist carpi

Keep for reference

Measurements *C. olsoni*

13

Compared with *C. columba* (also ratios)

	<i>C. olsoni</i>	<i>C. columba</i>
<i>Microphm</i> 58.2-59.8 Length to internal condyle	61.6	66.2-69.2
^{22.9% glst} 13.7 Breadth proximal end across bicipital crest	15.5 ^{25.1% glst}	14.7-15.1 15.0 7.0-7.3 8.2-8.25
Distance head to distal edge bicipital crest	14.0 ³	14.4-14.8 14.7
9.0 7.0 Breadth distal condyles	7.0 ¹	7.5-7.9
3.3 3.2 Breadth shaft	3.8	3.4-3.6 ^{3.2} 3.45 3.6
5.5 5.6 Depth shaft	4.8	4.5-5.0 ^{4.4} 5 ^{ulna} 5
60.6 57.1 ⁹⁰ Ratio breadth to depth of shaft	79.0%	72.7 72.7 ^{ulna} 69.72
Breadth pectoral attachment	3.8	3.5-
Length pectoral attachment	7.5	9.4-
Ratio breadth to length pectoral attachment	50%	38.0-40.6% 37%-
Brachial impression	?	?
<i>Microphm</i> 53.6% Ratio br. dist. to sh. dist.	4.1%	Br 2.4 Length 13.6 17.6
9.4% Ratio depth sh. dist.	7.8	2.7 14.0 19.0
H + ectepicond. proc.	8.2	2.6 14.0 18.5
9.0 br. dist. end	9.4	9.0-9.5
Ratio 9.0 dist. to length	15.2%	9.3-9.5
Ratio br. condyle to dist. end	11.5%	13.5-14.0
		11.2-11.7%

Uria ?

The following specimens (UCMP no. 88704) represent a murre, genus, Uria: lower portion of right and left coracoids, articular end of right scapula, complete left and distal 3/4 of right ulna, distal ends of right and left radii, distal end of left carpometacarpus, and a wing phalanx. The bones were found together at locality V68147 and appear to belong to one individual.

Compared with a series of six modern skeletons of the Common Murre, Uria aalge, the following differences are noted:

Scapula: proximal end more evenly expanded, glenoid facet less protruding and narrower, blade relatively thicker dorsoventrally. *Resembles Eudomy chelon*

Coracoid: scapular facet more deeply depressed and sharply never quite reaching sharply rimmed, glenoid facet flatter and slightly external border more sharply projected anteriorly (only lower portion of facet is preserved), longitudinal intermuscular (in U. aalge, line touches ext. border) line along ~~external~~ edge of anterior surface of shaft

Ulna: internal side of shaft below cotyla less depressed, ligament attachment above brachial impression flatter and more evenly contoured, tricipital attachment (on anconal edge of external cotyla) more deeply notched, and shaft more rounded, less blade-like.

Radius: the two specimens are not well preserved, but appear, like the ulna, to be more rounded than in U. aalge.

Carpometacarpus: metacarpal 3 rounding in distal contour. The contour is angular in U. aalge.

In the character of the carpometacarpus and the shape of the ligament attachment of the ulna the fossil resembles U. lomvia more closely than U. aalge. Other characters are ~~exxxxx~~ so similar in the two living species, ~~xx~~ that it is possibly that individual variation would account for what difference appear.

See Amer. Jour. Sci.
1870 Ser. 2 Vol. 49
no. 144, p. 213
Tarbo, N. Canada
Museum of Peab?

also compared with disarticulated bones of Uria from kitchen middens in Amherstburg (possibly representing both aalge & lomvia)

resembles Eudomy chelon in this char.

Measurements of Uria bones from San Diego County (Tarry Borne)

V68147/88704

Scapula

Fossil
88704
Recent
U. calif

Br. prox

Br. glenoid

dimension
Steno-facet

depth
int edge

dimension
acromion

Ratio
x y

rt & left coracoids
Broken off through the
glenoid facet
rt scapula

10.5

5.35

5.1 x 6.5

2.6

3.9

68.3%

11.1

5.2

4.3 x 5.3

2.65

3.3

88.4%

11.3

6.3

3.8 x 4.3

2.2

3.4

81

11.2

5.9

3.4 x 4.2

2.2

3.0

88.4

11.4

6.1

4.0 x 6.0

2.2

3.8

ulna

10.8

6.2

3.7 x 4.8

2.1

3.3

78

11.7

6.0

7.1 x 4.7

2.2

3.2

Dimensions

11.1

6.0

3.7 x 4.5

2.1

3.2

78

11.4

6.4

3.9 x 5.3

2.0

3.3

78

4.8

4.8

4.5

3.9 x 3.5

3.9

5.0 x 2.9

5.0

4.6

4.3

4.4 x 3.8

4.4

5.0 x 2.9

4.8

4.7

4.3

4.3 x 3.6

4.3

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

5.1

4.8

4.6

4.0 x 3.5

4.0

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

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4.2

4.2 x 2.6

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4.8

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4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

4.8

4.8

4.2

4.2 x 3.3

4.2

4.2 x 2.6

On the ulna the acipital attachment (proximal

end back of external cotyla) is very deep cut T ligamentous
attachment above (+ acromion) ~~basal~~ impression is ~~between~~ ~~between~~ ~~between~~
+ less parallel to shaft so that groove ~~between~~ ~~between~~ ~~between~~
acromion is narrowed distally. (4.5 x 2.7) (Uria) 4.1 x 2.0 (H696) 4.2 x 2.5;
(507) 4.0 x 2.9; (674) 4.0 x 2.7; (480) 4.0 x 2.6. (Alca) 3.9 x 3.5 (4.2 x 1.9 = #697) (5.0 x 2.3 494)
(4.4 x 2.4) 485

The external intermuscular line on the coracoid is
possibly slightly more ventrally situated at its most external
edge + appears to extend nearer to the sternal end, but, as the
sterno-coracoid process is broken away, this detail is questionable.
There is considerable variability in the sternal extent of this line in the
Recent specimens

1855 Uria lomvia
Recent Uria + calif compared
Jace 507, 477, 697, 674 (+ 696 in ulna)
coracoid, scapula, radius, ulna

and Alca + Uria
Jace 1857 coracoid + scapula
1849 ulna + coracoid
Junda curvata 1857 ulna, coracoid, scapula
Tubercula coracoid 500 ulna, coracoid.

Measurements of Murres scapulae
from the Aleutians (Ward's material)

	Greater br.	Depth acromion	length / breadth (glenoid surface)	br. sh.	br. length Ratio glenoid	
Right	11.55	3.9	4.9	4.1	5.0	83.6%
	13.35	3.9	5.13	4.3	5.1	81.2
	12.3	3.95	5.25	4.35	5.05	82.7
	12.5	3.85	5.55	4.25	5.2	77.3
	12.0	3.7	4.75	4.1	4.6	86.4
	12.5	4.05	5.2	4.1	5.0	79.0
Left	12.35	3.7	5.9	4.0	5.1	67.8
	11.4	3.4	5.1	3.5	4.7	68.6
	11.5	3.9	5.25	3.7	4.7	70.5
	12.6	3.75	6.0	4.0	4.8	66.6
	12.35	3.5	5.5	3.7	5.0	67.5
	12.2	4.1	5.0	3.65	4.35	73.0
	12.3	3.7	5.6	3.7	4.9	66.2
total from Bones	10.6	3.4	5.0	3.45	4.1	69.2

1176 *Brachyramphus* has no ^{foramen} in process & a very short process. But ant. intermuscular line is slightly out to ext. margin + ^{scap. facet protrudes}
 Out Less prominent olecranon of ulna, prominent broad, short coracoid facet of scapula
 Squared of dist margin of M3 ~~carpometacarpus~~ Dist end radius doesn't flare like fossil

687 *Synchiropneustes* has ~~no~~ process with foramen, but ant. intermuscular line blends with ext. margin of coracoid + ~~deep~~ facet is not protruding
 Dist end M3 at angle, coracoid facet of scap. broad + short + protrudes, ulna with prominent olecranon, not very deep shaft of ulna

528 *Pygocentrus* - very reduced process, no foramen. Scapular facet very deep + ^{ant. facet} Scapula with very short, protruding coracoid facet, slender, not prominent acromion, short ext. dist. head.

Out X *Carpometacarpus* has rounded dist. end M3 but symphysis relatively short
 X Dist end radius line on "back" discontinuous as in fossil

667 *Eudomychus hyphaleuca*, process long with foramen, ant. intermuscular line inset from ext. edge shaft, scapular facet protrude
 Carpometacarpus with dist end M3 rounded + symphysis long.
 Olecranon of ulna prominent. carpal process dist end ulna very short (longer in fossil). Coracoid has deep cup of scap. facet like fossil

ulna shaft

667 2.3 x 3.5 - 65.0%

1132 2.1 x 3.2 45.6%

825 1.9 x 3.4 54.9%

665 2.2 x 3.4 64.8%

561 2.3 x 3.3 69.7%

535 *Cerodroma maculata* - long process with foramen, but narrow shaft + very deep sternal facet. Distal end of M3 rounded but facet for digit 3 is raised + symphysis short (fossil facet for digit 3 is about on line with large facet for digit 2. Coracoid facet of scapula short + prominent. ulna very much like fossil in shape of attachment lig.

Eudomychus

665 *Eudomychus craveni* ♂ (body shell)

825 ♀ im " " hyp. less

561 ♀ hyp. ~~adult~~

667 ♀? hyp. complete

1132 *craveni* " ♂

664 *craveni* " ♀

~~Endomyelium~~, Una?

The size of the bones is approx. that of minimum specimens of *Uta a. californica*, but certain ~~paracitatus~~ ^{gen. Uta} characters are evident and ~~the congeoid resembles that of the same in general~~ ^{and general characters such as proportions and long} paracitoid with well defined foramen. These characters ~~are shared~~ ^{are shared} with several other alcid genera including *Alea*, *Synthlibramphus* & *Eudomyclerus*. In *Alea*, however, the sternal facet is deeper, and ~~points~~ ^{points} toward the int. side. Characters which distinguish the fossil congeoid from that of *Uta* are

- ⑦ ~~scapular~~ ^{capitulum} scapular facet is more deeply cup-shaped,
the glenoid facet projects beyond the shaft
(only the distal third of the facet is present in the joint)
the ^{ext} anterior intermuscular line is more clearly
inset from the ext. edge of the shaft.

Nine bones representing ^{an adult} ~~the genus~~ ~~Uria~~ were found close together at locality 168147, and appear to belong to the same individual. The elements represented are; right & left coracoids (both broken above the procoracoid), articular end of scapula, complete left ^{and} distal $\frac{3}{4}$ of right ulna; distal ends of right & left radii, distal end of left carpometacarpus, wing phalanx.

~~Qualitative distinctions between the two living species of murres, Uria aalge & U. lomvia are not clearly evident~~

Compared to a series of ^{available} skeletons of the Common Murre Uria aalge, the following differences are noted;

Scapula with more ~~evenly~~ ^{expanded} proximal end (less prominent), narrower glenoid facet ^{relatively} ^(disproportionately) thicker blade; ~~concordant with more~~ deeply depressed scapular facet, ^(unfused with the coracoid) articulation of the scapula is broken. ^{possibly the glenoid facet} ~~the lower part of the coracoid~~ facet is more projected beyond the shaft, but as only the lower part of the facet remains, ^{+ this appears to be somewhat intermediate} this char. is questionable. The characters of the lower part of the coracoid are somewhat variable in the living sp., but the fossil does appear to have a more clearly depressed scapular facet.

~~The size of the bones suggest an individual.~~

Measurements of the bones suggest an individual ^{about the same size as} ~~close in size~~ ^{size of} Uria aalge californica. Certain ^{qualitative} characters, however, more closely resemble those of members of the genus Eudomychus.
The

thicker
shaft in fossil

$g_c = 65.0 \text{ cm}$
 $r = 4.69 \text{ cm}$

Ulu

		Scaphula					✓		✓				G	H	I	L	O	R	S	Q	U
DA	A	B	C	D	E	F	Ratio	BA	CA	ED	EA	Distance between bore and distal.	Length of edge of style	Gr. dist	Palman for prox	for true mid of brake work	depth same place	middle for depth	for	depth pair with	
56.4 Oceanicid 88704 R	10.5	4.1	2.4	5.6 5.3	3.6 3.4	3.5	58.5	39.0	22.8	71.7	36.2	37.1	61.9	62.6	8.3	4.3	5.8	3.9	5.4	9.25	
U. lomela 41.4 1855	11.1	4.1	1.8	4.6	4.2	3.5	44.9	36.8	16.2	91.3	37.8	41.5	67.0	68.2	9.0	4.2	5.7	3.6	5.8	9.5	
Alachabius 47.5 A	12.2	4.7	2.2	5.8	4.5	3.9	46.8	38.5	18.0	77.5	36.8	40.9	66.7	68.2	8.9			4.1	6.2		
44.2 L	12.2	4.4	2.4	5.4	4.1	4.2	54.5	36.1	19.6	76.0	33.6	42.9	67.4	68.7	9.1			4.7	7.2		
52.4 L	12.2	5.2	2.4	6.4	4.4	3.3	46.1	42.6	19.6	65.2	37.6	42.7	67.5	68.3	8.4			3.8	5.6	9.9	
45.3 R	11.7	4.5	2.4	5.3	4.4	3.8	53.4	36.4	20.5	83.1		41.0	66.7	67.5	9.1			4.4	6.8		
45.1 R	11.3	4.4	2.4	5.1	4.5	3.9	54.5	39.0	21.2	88.3		42.6	68.6	69.6	9.0			4.4	6.6		
47.2 L	12.7	4.9	2.5	6.0	4.6	3.4	51.0	38.6	19.7	76.6		43.6	67.8	68.4	8.5			3.8	5.9		
48.3 L	11.8	5.0	2.4	4.9	4.3	3.9	48.2	42.3	20.3	87.7		41.9	67.2	68.3	9.0			4.3	6.4		
46.4 L	12.5	4.9	2.2	5.8	4.4	3.7	45.0	39.2	17.4	75.7		41.2	69.0	69.8	8.8			4.1	6.1		
39.1 R	12.8	4.6	2.2	5.0	4.5	4.2	42.8		17.2	90.0		8.5406 M 67.5	59.8 68.6	60.8 8.8				37.3 4.1	56.6 6.2		
46.4 L	13.6			6.3	4.8	4.0				76.2			64.7	66.5	9.4			4.7	5.9	10.7	
44.3 R	12.2	4.8	2.2	5.4	4.6	3.9	45.9		18.0	85.2		38.5	64.7	66.5	9.4			4.0	5.9	10.7	
U. alage 42.4 697	11.0	4.5	2.1	4.7	4.0	3.5	46.6		19.1	85.2		38.7	64.3	65.6	8.3			4.1	6.2	10.0	
44.2 485	11.1	4.6	2.0	4.9	4.4	3.1	43.6		17.4	89.9		38.1	63.3	64.5	8.3			3.9	5.75	10.2	
43.4 494	11.5	4.8	2.1	5.0	4.0	3.2	43.7		18.2	80.3		42.3	68.2	69.3	8.2			4.2	6.35	10.3	
41.6 477	11.4	5.0	2.1	4.75	4.0	3.5	42.0		18.4	84.3		38.2	64.0	65.4	8.3			4.3	6.5	9.8	
43.6 3321	11.0	4.2	2.3	4.8	3.8	3.2	54.8		20.9	79.3		38.1	60.0	61.3	8.0			3.8	5.7	10.0	
56.0	11.1											59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		
												59.0	58.3	7.3	3.9	5.7	3.3	5.5	9.3		

Wm. Goodge, Variation in skeletal measurements of the common murre
 Condor 53:100 (1951).

Element	no. specimens	range	mean
humerus	205	80.8--89.5	84.78
ulna	180	61.4-69.6	64.92
radius	127	57.7-65.9	61.95
carpometacarpal	145	39.5-46.0	43.29
coracoid	69	37.4-32.4	40.67
femur	72	45.1-50.6	47.42
tibiotarsus	30	80.7-89.2	85.25
tarsometatarsus	37	34.7-40.3	37.31

widths ~~shaft~~

ulna shaft	119	3.4 - 4.2	3.75
rad. "	126	2.2- 2.9	2.51
tarsus "	35	3.3-4.0	3.62
tibia dist.	17	7.1-8.2	7.82
femur shaft	62	3.2-4.1	3.76
femur head	66	3.9-4.8	4.38

all measurements (except some of humerus) from series found in
 Indian middens on Southeast Farallon Island in 1949.

4 Four other Pteropus alcid have been described. One, *Chia*
auronigra (mid Ples of Italy) is known ^{only} from a distal end of humerus
 which possibly

All that can be said of *U. auronigra* (known only from a
 distal humerus) is that it possibly was ~~similar~~ ^{related} to *U. auronigra*

LAM 107032 LAM Alcids humerus # 107032
 Shape less compact than large; Bicipital area relatively deeper prox-distally than U. or C. humeri
 Ectepicondylar process with rounded contour & less projected at its prox tip than U. or C.
 The rest of the contour given by the deep depression between it & deltoid crest as in U. & Pinguinus & also
 Bicipital surface sharply dips by deep depression between it & deltoid crest as in U. & Pinguinus
 Auronally int. condyle does not project as much ventrally as in U. or C. (recalls U. or C.)
 Distal end swings slightly palmar - as in U. or C., less than in Pinguinus.
 The deltoid crest 16.5 mm. is
 long for the size of the humerus & is not
 as clearly ended distally as in U. or C.
 Such a humerus is characteristic of U. or C.
 rapid even concave outline in dist. view
 rather.

Length to int. condyle (l)	6.1	Cephus columba	66.2	U. or C. range	86.3
Pr. prox from bicip. crest	15.5	" "	15.0	" "	16.4
Bicip. crest to head	14.0	" "	14.3	" "	15.3
Pr. dist condyle	7.0	" "	7.5	" "	8.5
Depth dist (calc. to dist. condyle)	6.4	" "	6.9	" "	8.7
Pr x depth of (mid)	3.8 x 4.8 (49%)	" "	3.4 x 4.5 (49%)	" "	3.9 x 7.8 (50%)
Depth x br. post. attach.	2.5 x 3.8 (50%)	" "	2.4 x 3.4 (58%)	" "	11.3 x 2.6 (23%)

Auronally - prox end resembles *Cephus columba* in degree of depression below head
 and position of pectoral attachment. However the attachment is more clearly defined, more concave
 shorter & broader & the shaft medial there is more ventral ridge
 the area is very different in U. or C. being broad & shallow & the pectoral attach. long & slender ridge
 in U. or C. distal end the depression below the head is even greater than in the prox & the pectoral attachment
 encroaches further across the head.

Cephus n. sp

The following elements, assignable to the Alcidae were found together at locality V68147: R + L coracoids (lower portion only), right scapula, complete left + distal $\frac{3}{4}$ right ulna, right + left distal ends of radii, distal end, L chevron/acarpus, and a wing phalanx, there appears no reason to doubt that all belong to one individual.

Generic characters are best preserved in the coracoids and ulna. They align the bones with *Uria*:

~~The coracoid has the well developed pectoraloid of with concave contour moderate length, with well developed foramen about centrally placed. These characters are shared by *Uria*, *Pinguinis* + *Alca*.~~

~~The ulna has a relatively short olecranon, pointed at the tip; ^{the attachment for the ant. lig.} ~~the brachial impression~~ is ~~long~~ ^{oval} + well developed. *Pinguinis* has a short, but blunt olecranon + poorly marked lig. attachment; *Alca* has a long, ^{more slender} curved olecranon + a triangular shaped lig. attach.~~

~~The moderately long pectoraloid, ^{moderately} ~~concave~~ in posterior view contour with well developed foramen, characteristic of *Uria* and the ulna with short, pointed olecranon, long brachial impression + oval attachment of ant. lig., also as in *Uria*.~~

In size the bones are closer to *U. aadgi* than *U. lomvia*, but in qualitative characters resemblance is nearer to *lomvia*. Other char. are distinctive + the species is therefore described as new.

Uria

Cephus n. sp.

Material: Humeri 102032 from LACM loc 4297

Character: ^{Resembles Cephus columba in breadth, less slender shaft than Uta & Landa}
 1. Anconally; prox end resembles Cephus columba in degree of depression below head + position of pectoral attachment

Character: Prox end resembles Cephus columba in degree of depression below head + position of pectoral attachment, also resembles Cephus in breadth vs depth of shaft (less compressed than in Uta & Landa) Bicipital contour distally, broadly rounded

Shorter ^{than} humeri of C. columba but ^{rel} stouter
 prox br. across biap. cres 15.5
 br sh 3.8 length 61.6 (6.19%) C. columba br sh 3.4 length 66.2 (5.11%) } 75%
 depth sh 4.5 " 66.2 (6.79%) }
 dist br 7.0 " 61.6 (7.79%) " " dist br 7.5 66.2 (11.32%)
 depth sh 4.8 " 61.6 (11.36%)
 dist br 7.0 " 61.6 (11.36%)
 of Uta from LACM loc. 6906 → br x depth sh. 3.65 x 5.5 prox br. 7.4
 C. columba br/depth sh. 3.2 x 4.4 prox br. 7.0-7.3
 3.45 x 5
 3.6 x 5

Humerus
 Microcephalus macleayi shaft diameter 3.3 x 5.5
 br. condyles 9.0
 length of humerus n type 58.2 mm (Cephus columba 62.7)
 prox br. ref specimen 13.7, length same spec. 59.8

Cephus LACM 102032

length 61.6 (C. columba 66.2)
 prox br. across biap. cres 14.0 (14.7 C. columba)
 br pectoral attach. 3.8 } ratio C. columba br. pect. attach } ratio
 depth pect. attach 7.5 } 50% 37%

Sept 3, 1978

Cephalus cont'd

Discussion. - Humerus 107032 resembles the element with
Guilemots (genus Cephalus) as distinguished from the Auk
Murre & Puffins in the broader, less blade-like shaft and
the broadly rounded relatively deeper (proximal-distally) bicipital ^{crest}
The proximal end resembles this area in the humerus of

C. columba in degree of compression below the head and
the position of the pectoral attachment though the attachment
is more concave in the fossil

The genus Cephalus was tentatively recorded from
loc LRCM 6906 on the basis of an incomplete proximal end
of ulna (LRCM 45045). As the ulna agrees in size ^{with humerus 107032}
& C. columba ^{as well as} in degree of distinction from the recent
species, it is probable that ~~this~~ it represents C. Olsoni

Note Check - attach for ant. art. lig. of humerus relative
to gradual impression as compared to this arrangement
in the ulna. ~~How~~ Do they both differ from C. columba
in the same general manner?

Measure all C. columba humeri & ulnae for br. of shaft
and length same meas for 107032 & ulna 45045

Compared to humeri of Microcephalus malinzi

Compare
with
all humeri
& Microcephalus
malinzi
LRCM 45045
25668
shows the
same distinction
as humeri
015m has
proximal head
Microcephalus 5.5m
add to the distal
group

? *Actinia* sp.

Nickerson, March 1925
 Description. — Resembles *hemerus* 18949 from
 separated to *Aetna* near *novi* Harvard 1968 ^{identus? Aetna 82}
 from La 1945 and latter 37606 from Laom 6906. in
 immersion bordered

rounded shaft, portion of brachial impression bordered
externally by slight rim and attaching ant. lig. facies
more palmed than laterally. ~~size~~ It falls between these
rounded specimens in size.

Measurements: ^{Dental} Breadth from external condyle through

ligamental attachment 5.0 ~~length of incisor~~ breadth 3.6

Cephus sp.

Laurel Loc. 42970

Characteristics

Quiddis -

with?

David

Mauella enerv²

Mauvalla hirsuta

long to part, attach
 107032 = 2.5
 h-pw = 15.5
 long to part attach
 c-attach = 9.4
 h-pw = 15.0

Alcid 4/13
P-wet caan
P-wet. P-wet
P-wet. P-wet

Aethia sp.

Cephus

Undet. parvula

91

scale

2

Phalenz

scapulae

Pranamaala:

underfinner

1000

94B

57

43/38
62-44

Aethia sp.

14

Aug. 23, 1978
Reviewed +
Copied

Referred material.-- Left humerus lacking proximal end, LACM 107031 from LACM locality 4297, collected by Bums & McKenzie?

Discussion.-- This small auklet humerus resembles humerus LACM 18949 from the Late Miocene, Monterey Formation in Laguna Hills, Orange county, California, LACM locality 1945, which was referred to Aethia rossmoori Howard 1968, and humerus LACM 37686 from a slightly later facies of the Monterey Formation in Orange County, LACM locality 6906 recorded (Howard 1978) as "Aethia sp.", in the following characters: rounded shaft, position of brachial impression bordered externally by a slight rise, and attachment of anterior ligament facing more palmar than laterally.

In size the Oceanside bone falls between the two previously recorded specimens, approx 80% larger than 18949 and 60% smaller than 37686. The previous similar specimens were in order to agree in placement with the specimen from Oceanside, remeasured for this study.

Measurements.-- Breadth of distal end from external condyle through ligamental attachment 5.8 mm (LACM 18949, 4.6 mm, LACM 37686, 5.3 mm); breadth and depth of shaft 2.0 and 2.7 mm respectively (LACM 18949 1.8 and 2.6 mm; LACM 37686, 2.3 and 3.4 mm); height of ectepicondylar process above distal end 4.9 mm (LACM 18949, 4.5 mm, LACM 37686, 5.2 mm). Ratio of height of ectepicondylar process to breadth of distal end 98% (97.8% in LACM 18949; 98.1% in LACM 37686); ratio breadth of shaft to breadth of distal end 40.0% (39.1% in LACM 18949, 43.3% in LACM 37686); ratio breadth to depth of shaft 74.0% (69.2% in LACM 18949; 67.6% in LACM 37686); ratio of distal breadth relative to same dimension in LACM 18949, 108.6%; ratio of distal breadth relative to same dimension in LACM 37686, 94.3%.

Check the incision of the trochlear grooves in comparison to a rossmoori referred to Aethia sp. 6906. More incised in 1945. rossmoori than A. sp. (Howard 1978 p. 21)

?Aethia sp.

Referred Material.-- ^{left} Humerus LACM 107031, lacking proximal end.
From LACM locality 4297, ^{at} Collected by Lawrence Barnes and Robert
McKenzie, March 1975.

Description.-- This specimen resembles ^{humeral part of Satitricus monkey found in Orange County} humerus LACM 18949 from
locality LACM 1945 referred to Aethia rossmoori Howard 1968, and
~~humerus~~ LACM 37686 from locality LACM 6906 recorded as ?Aethia sp.
(Howard 1978) in rounded shaft, ~~position of brachial impression and~~
~~bordering~~ ^{ed} externally by slight rise, and attachment of anterior lig-
ament facing more palmar than laterally. It falls between these two
previously recorded ^{humeral} specimens in size. All three specimens differ from
modern specimens of ~~humeral~~ humeri of Aethia pusilla and A. pygmaea in greater
depression ~~of~~ the brachial area and depression of the attachment ~~of~~
Of the three fossils, only LACM 107031
for the anterior articular ligament. / ~~Only xxxxxxxx is pre-~~
^{complete distally} served in the area of the tricipital ridges, ~~anconally~~. It differs from
^{↑ specimens of living species} this area in modern Aethia in lacking the deep depression between the
internal and median tricipital ridges. ~~Possibly~~

Measurements.-- Breadth of distal end 5.2 mm (LACM 18949, 4.5 mm;
breadth of
LACM 37686, 5.1 mm) least shft ~~xxxxxxx~~ 2.1 mm (LACM 18949, 1.9 mm;
LACM 37686, 2.3 mm) greatest breadth of shaft at same place 2.7 mm
(LACM 18949 2.4 mm, LACM 37686 3.3 mm) distance from distal condyle to
ectepicondylar process 4.9 mm (LACM 18949 4.5 mm; LACM 37686, 5.0 mm)

Copied

Aug, 12, 1978

Aethia sp.

Referred Material.-- Humerus lacking proximal end, LACM 107031, from LACM locality 4297.

Orange

Discussion.-- This small alcid humerus resembles humerus LACM 18949 from the Late Miocene, Monterey Formation in Laguna Hills, Orange C LACM locality 1945, referred to Aethia rossmoori Howard 1968 and humerus 37686 from a slightly later facies of the Monterey Formation in Laguna Niguel, LACM loc. 6906 recorded (Howard 1978) as Aethia

sp., as follows: rounded shaft, position of brachial impression bordered externally by slight rise, and attachment of anterior ligament facing more palmar than laterally. In size the Oceanside bone falls between the two previously recorded specimens. Breadth of distal end from external condyle through ligamental attachment 5.0mm (LACM no. 18949, 4.6mm ~~xxxxxxx~~ LACM no. 37686, 5.3mm) breadth and depth of shaft 2.0 and 2.7 mm respectively (LACM no. 18949 1.8 and 2.6; LACM 37686 2.3 and 3.4 mm); height of ectepicondylar process above distal end 4.9 (LACM 18949, 4.5 mm, LACM 37686 5.2 mm). Ratio of height of ectepicondylar process to breadth of distal end 98% (97.8% in LACM 18949 and 98.1% in LACM 37686); ratio breadth of shaft to breadth distal end 40.0% (39.1% in LACM 18949; 43.3 in LACM 37686); ratio breadth to depth of shaft 74.0% (69.2% in LACM 18949; 67.6% in LACM 37686). Ratio distal breadth to LACM 107031 to same dimension in LACM 18949, 108.6%; ratio distal breadth LACM 107031 to same dimension in LACM 37686 94.3% (8.6% larger than 18949, 5.7% smaller than 37686)

Aethia pygmaea br dist end 4.3
 " " br / depth shaft 2.0 / 2.6 ratio 76.9 %
 " " Int ectepicondylar process 5.2 ratio to br dist end
 " pusilla br sh. 2.1, depth sh 2.9 above ect epi proc
 " " least br sh 1.7, depth same place 2.5
 " " br dist end 3.9

near taken 1967 probably in diff. places than those typed above

RECEIVED
 U.S. DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT
 WASHINGTON, D.C. 20250

Aethia sp.

Material Available.-- Humerus lacking proximal end, LACM 107032,
from LACM locality 4297, collected by
Description.

VCMP 88704 ?Uria sp. 02
?Endomychura sp

Nov 26, 1972

Not used in this bone but kept for data

Nine bones representing an alcid were found close together at locality V68147 and appear to belong to the same individual. The elements represented are: right and left coracoids)both broken above the procoracoid,, articular end of scapula, complete left and distal 3/4 of right ulna; distal ends of right and left radii; distal end of left carpometacarpus, wing phalanx.

The size of the bones is approximately that of small modern skeletons of Uria aalge californica, the California Murre. The coracoid resembles that of the genus Uria in general proportions and long procoracoid with well-defined foramen. These characters are shared, as well, by Alca, Synthliboramphus and Endomychura. In Alca, however, the sternal facet is deeper anteroposteriorly towards the internal side. Characters which distinguish the fossil coracoids from those of Uria are: (1) scapular facet more deeply cup-shaped, (2) glenoid facet projecting beyond the shaft (Only distal third of facet is preserved), and (3) external anterior intermuscular line more clearly inset from the external edge of the shaft. In all of these characters, the fossil coracoids most closely resemble those of the murrelets, genus Endomychura.

The fossil scapula differs from that of Uria even more markedly than the coracoid in more evenly flared proximal end, with less prominently projected, and longer glenoid facet. Again closest resemblance is found in Endomychura.

The fossil ulnae, though very similar in general appearance to this element in Uria, have a more rounded, less blade-like shaft, the distal carpal tuberosity is shorter and arises from the shaft more abruptly and at the proximal end, the notch at the anconal edge of the external cotyla is deeper and slightly more externally placed. The position of the notch and the rounded shaft are also found in

also about 72%
67% 90

Endomychura. The olecranon in the latter genus is, however, more attenuated, the ligamental attachment shorter and broader and the carpal tuberosity at the distal end, though similar to the fossil in its abrupt connection with the shaft, appears to be relatively shorter and less distinctly set off from the distal trochlea. Also the ulnar shaft in Endomychura is slightly more bowed in lateral profile.

The radius at best is a difficult element to assess. the two incomplete radii in the Oceanside material equal specimens of Uria aalge californica in breadth of distal end, but are more rounded in the shaft, and the ligamental attachment is more prominent. These distinctions apply, as well, to comparison with Endomychura.

Only one distal end of carpometacarpus is preserved, but in this the distal symphysis shows distinction from Uria in the rounded profile of M3 immediately proximal to the facet for digit 3; in Uria M3 has an angular profile; the fossil most closely resembles Endomychura in this character.

with Endomychura
In view of the similarities in coracoid, scapula and carpometacarpus, relationship to this genus is strongly suggested. The distinctions in the ulna and radius may be purely specific, but the possibility of distinct generic status for the fossil cannot be ruled out. If these Oceanside fossils do, indeed, represent Endomychura, this is the first fossil record of the genus, and the species is nearly twice the size of either of the living species of Endomychura.

Four other Pliocene alcids (exclusive of the Mancallinae) have been described, three of which are from North America. Brachyramphus pliocenae and Ptychoramphus tenuis from the San Diego Formation are both much smaller than the species represented at Oceanside. Australca grandis from the Lower Pliocene (Bone Valley Formation) of Florida is well represented at the type locality and it has been possible to determine from the relative sizes of the several elements that the species was "well on the road to flightlessness" (Bordkorb, 1955:29)

check 1947
+ Cedar
2 bones tentatively assigned from Cedar (1971:63)
shown same "NO." 2 sp. 2 sizes

1955:29). The ulna was apparently about the size of the specimens from Oceanside, but the coracoid was notably larger, ~~but~~ proportionately longer and more slender, with procoracoid more ~~centrally~~ placed in the posterior face of the bone judging from the illustrations accompanying the type description. ~~No comparison can be made with the Uria ausonia Portis from the Middle Pliocene of Italy; the species is known only from a fragment of humerus, possibly~~
The fourth species, Uria ausonia Portis, was described from the Middle Pliocene of Italy on the basis of a fragment of distal end of humerus, ~~which~~ and except for possible similarity in size to the species at hand, cannot be compared.

✓ *Synthlibrauphus* has straight bill
coracoid with long processes + foramen
humerus not much excavated
fairly blunt head not

Brachyramphus has straight bill
no foramen in coracoid - short processes
humerus not undercut but head comes down in joint

✓ *Synthlibrauphus* has straight bill
humerus fairly blunt head
coracoid with long processes + foramen
humerus not deeply undercut below head

Cerorhamphus - straight bill - slightly convex dorsally
humerus well excavated below head but narrow
very long processes with low foramina (narrowed ^{dist} ~~dist~~ ^{distal} ends)

Phyllopteryx - no long processes or foramen
humerus excav. below head

✓ *Cepphus* - straight skull + mandible
1173
straight head blunt (some extra antennae on head)
humerus excav. below head but area narrow
large pectoral scar
Coracoid - long slit-like foramen at inner edge of process
(sometimes edge breaks through)

✓ *Fulicula* - Deeply excavated below head but narrow humerus
broad pectoral scar
Very long processes - small foramen quite low
narrow skull dist (like *Cerorhamphus*)
bill has big bumps
straight head blunt

Sterna - high beak
deeply undercut humeral head but narrow
pectoral scar moves medially at head
pectoral scar depressed - broader prox than distally
(no an oval)
Coracoid with long processes + low small foramen
narrow skull dist (like *Cerorhamphus* + *Fulicula*)

TABLE I

Measurements (in millimeters) of Uria paleohesperis compared to
Recent Uria aalge californica

	<u>Uria aalge</u> <u>paleohesperis</u>	<u>U. a. calif.</u> max.	<u>mean</u>	min.
Scapula				
Breadth proximal end	10.6	11.5	11.1	11.0
Glenoid facet, length	5.9	5.7	5.5	5.0
Glenoid facet, breadth	3.7	4.3	3.8	3.6
Shaft near prox. end				
Breadth	4.3	5.2	4.6	4.1
Depth	2.5	2.25	2.15	2.1
Coracoid (right)				
Length from sternal facet to lip of scapular facet, measured dorsally	23.4	26.4	25.0	24.3
Breadth of shaft at level of foramen	4.8	4.7	4.5	4.4
Breadth sternal end	14.6	16.2	15.1	14.6
Depth of sternal facet	4.5	5.1	4.5	4.2
Ulna				
Greatest length	62.6	69.5	65.3	61.3
Breadth proximal end	8.5	8.6	8.3	8.1
Depth proximal end internally to <u>stylo</u>	9.7	10.15	9.9	9.8
Middle shaft, breadth	3.85	4.3	4.0	3.8
Middle shaft, depth	5.35	6.6	6.1	5.75
Greatest breadth of brachial impression	3.5	3.4	2.9	2.6
Radius				
Breadth of distal end	5.7	5.9	5.7	5.6

TABLE II

Measurements (in millimeters) and ratios (in per cent)
of humeri of Cepphus olsoni and C. columba

	<u>Cepphus olsoni</u>	<u>Cepphus columba</u>
Length to internal condyle	61.6 [✓]	66.2-69.2
Breadth of proximal end across bicipital crest	15.4 [✓]	14.7-15.1 [✓]
Breadth of distal condyles	7.1 [✓]	7.4- 7.9 [✓]
Breadth of shaft (middle)	3.8 [✓]	3.4- 3.8 [✓]
Depth of shaft (middle)	4.8 [✓]	4.6- 5.1 [✓]
Ratio of breadth to depth of shaft	79.1 [✓]	72.0 -73.9- 74.5 [✓]
Ratio of breadth to length of pectoral attachment	50.0 [✓]	38.0- 40.6 [✓]

ulna prox depth cedros 10.1 9.9.
br. " 6.5 6.8
lul 28.4 31.6
sh depth 6.5 6.1

Cedros { 6.55
30.9
6.3

9.8
29.8 Cedros

32

119289 119291
9.5 depth 9.0
6.1 br 5.7
30.2 dist 29.
6.1 sh 5.45

dist 9.5 9.4
br 6.0 6.2
lul 28.4 29.8
sh 6.1 6.0

Mancalla cf cedrosensis Howard 1971

Oceanside 119279 Referred material.-- From locality LACM 4301; 1 nearly complete, but poorly preserved humerus, 119165; 5 proximal ends of humeri (lefts), LACM 119222, 119223, 119269, (rights) LACM 119273, 119372; 4 complete ulnae (right) LACM 119287, 119288, (left) 119280, 119281; complete tarsometatarsus LACM 119298, shaft of tarsometatarsus LACM 119174.

Discussion.-- The humeri resemble this element of M. cedrosensis as distinguished from that of M. diegensis, M. milleri and M. californiensis in the characters described (Howard 1971:12) for the holotype: "...internal contour from shaft through bicipital crest broadly and gradually curved area below head between pectoral attachment and pneumatic fossa oval and deeply depressed." All are ~~fall~~ within the size range of M. cedrosensis except LACM 119372 which falls between M. cedrosensis and M. milleri in proximal breadth, (16.6 mm; M. milleri maximum 16.4; M. cedrosensis minimum 17.0 mm).

The ulnae the olecranon extends beyond the shaft in ulnar contour and there is a deep depression adjacent to the olecranon on the internal size. The depression is also present in the ulnae of M. milleri but the olecranon is less protruded in the smaller species. The four Oceanside specimens fall within the size range of M. cedrosensis (length 28.3-30.7 mm; M. cedrosensis 28.3-31.7 mm).

The complete tarsometatarsus has the proximal and distal flare as in both cedrosensis and diegensis as contrasted with the more columnar shape in M. milleri. In both LACM 119298 and the incomplete LACM 119174 the shaft is more depressed anteriorly than in either M. diegensis or M. californiensis, and both borders of the anterior face of the shaft are sharply defined as in M. cedrosensis. Measurements of LACM 119298: length 41.1, proximal breadth 10.1 (same measurements in M. cedrosensis 37.3-42.0 mm and 9.9-10.19 mm, respectively),

Measurements.-- Humerus, length to internal condyle 75.9 mm, proximal breadth 18.9 mm (same measurements in M. diegensis 71.0-85.2 mm and 17.3-20.3 mm respectively; and in M. cedrosensis 69.5-80.0 and 17.0-20.1 mm respectively). Proximal breadth of M. californiensis holotype (cast) 19.5 mm, referred specimen LACM 2576 from LACM locality 1067, 19.4 mm.

check ^{HS} again

Measurements (in millimeters.-- Humerus, length to internal condyle 75.9, proximal breadth 18.9 (same measurements in M. diegensis 71.0-85.2 and 17.3-20.3 respectively; in M. cedrosensis 69.5-80.0 and 17.0-20.1 respectively; in M. californiensis holotype (cast) proximal breadth 19.5, referred specimen LACM 2566 from locality LACM locality 1067, 19.4). Ulna, length 31.7, proximal breadth 6.1, proximal depth 10.1 (same measurements in M. diegensis length 28.0-32.1, proximal breadth 5.9-6.6, proximal depth and in M. cedrosensis, length 28.3-31.7, proximal breadth 6.2-7.2 proximal depth 10.0-13.3). Coracoid, distance from scapular facet to sternal end 34.4 (M. cedrosensis 31.6-33.9; M. diegensis 34.4-36.8) least breadth of shaft 5.2 (M. cedrosensis 5.2-5.4; M. diegensis 4.9-5.4); greatest depth through triosseal canal 6.8 (M. cedrosensis 7.0-7.1; M. diegensis 6.3-7.0)

119288
definite
anterior
flange
also
119280

119442 5.15
119384

L. 27.0
or 5.6
dph 8.3
5.8 x 5.4

119281
5.7
9.1
5.6 x 3.7
28.8

get ulnar
prox depth
for diegensis
119283 shaft meas.

119280
6.5
dph 9.4
6.1 x 3.5 2h
dph 30.7

119287
6.4
9.1
6.1 x 4.04
29.7 28.3

15404
Cedros
6.1 6.1
10.1 9.4
6.6 x 4.1 6.1 x 3.7
28.3 28.3

119288
Cedros
6.7
10.0
6.1 x 4.04
32.1

diegensis
ulna
1074
2248
diegensis
1080
23065
7.2
10.3
6.8 x 4.1
31.9
6.6
9.0
6.5 x 3.9

119282
25.5
8.3
5.4
5.1 x 3.0

4926
miller
26.1
5.8
3.4 x 5.1
dph?

diegensis
119279
6.8
10.3
6.9 x 4.5
31.7
2248
diegensis
6.4
9.0
6.1 x 3.8

1972
Mancalla diegensis + Phaeomacalla 21977

1972
Nor. 16, 1972
An incomplete coracoid (no. 88614) from locality V68106, ^{reps} Mancalla and a proximal end of a scapula (no. 95119) from locality V68145, both badly eroded, represent ^{Phaeomacalla} the extinct genus of flightless auks, Mancalla. Four species of Mancalla have been recorded from the west coast, all Pliocene in age: M. milleri and M. diegensis from the San Diego Formation (Late Pliocene), M. californiensis from the Repetto Formation (Middle Pliocene), and M. cedrosensis from the Almejas Formation (Middle Pliocene) of Baja California. Assignment of the Oceanside material to M. milleri is immediately ruled out on the basis of the much smaller size of M. milleri. Distinction from M. californiensis is evident in the coracoid in which the anterior border of the triosseal canal conforms to the anterior border of the shaft as in M. diegensis and M. cedrosensis (in M. californiensis the border of the triosseal canal is inset from the shaft border). Distinction from M. cedrosensis is based on greater length of the coracoid and its more slender proportions. Even in its poorly preserved state, the Oceanside coracoid is longer than any of the three available coracoids of M. cedrosensis, but comes within the size range of M. diegensis. Breadth of shaft and depth through the triosseal canal also conform to M. diegensis. The scapula is very broad across the proximal end and has a very heavy shaft. It is matched by one San Diego specimen in the Loye Miller collection at UCLA (no. 2345), assigned to M. diegensis.

q. coracoid
Measurements: Distance from scapular facet to sternal end

34.4 mm (M. cedrosensis 31.6-33.9 mm; M. diegensis 34.4 - 36.8 mm); least breadth of shaft 5.2 mm (M. cedrosensis 5.2-5.4 mm; M. diegensis 4.9 - 5.4 mm.); greatest depth through triosseal canal 6.8 mm (M. cedrosensis 7.0-7.1 mm; M. diegensis 6.3-7.0 mm).

distinct from
Phaeomacalla
more laterally
directed scapular
facet +
triosseal canal
facies more
robust more
dorsally

13.0
344)520
344
1760
1720
40

316)520
316
2040
1496
120

368)540
368
1720

344)460
344
40

66

Mancalla cf. diegensis (Miller 1937)

Referred material.-- Ulnae LACM 4301 ulna 1192792
coracoid UCMP 88614 UCMP locality V68106

length 31.7
br for 6.1
distal for 10.0

Complete humerus SDSNH 23567 from locality SDSNH 2643,

Discussion.-- In the ulna the olecranon is less prominent and the depression adjacent to it internally is smaller. ^{than in M. cedrosensis} The complete humerus has the very angular contour from the bicipital crest to the shaft characteristic of M. diegensis, M. milleri and M. californiensis and the broader, more shallow area below the head. It is distinguished from M. milleri by its larger size, and from M. californiensis ^{in that the} ~~by the~~ the muscle scar at the median border of the pneumatic fossa ^{with} does not protrude into the fossa as a distinct groove ^{as noted in caly (Miller & Horn 1949: 209)}

Measurements.-- Humerus length to internal condyle 76.0mm, proximal breadth 18.7 mm, distal breadth 6.6 mm. Same measurements in M. diegensis length 71.0-85.2; proximal breadth 17.3-20.3 M. cedrosensis length 69.5-80.0; breadth prox. 17.0-20.1, distal M. californiensis breadth of proximal end 19.4 mm (type) Distinction of the coracoid from M. cedrosensis is based on the shorter more robust proportions of this element in cedrosensis ?

San Mateo

Mancabinae

Maucailla videt

Hummeri

^v 119170
^v 129167, ^v 68, ^v 69, ^v 171
^v 119268, ^v 119270, ^v 271, ^v 119274, ^v 119276, ^v 119277
^v 275, ^v 278

^v 119302, ^v 119303, ^v 119304, ^v 305, ^v 306

119407

121530

Hummeri L. Acm

6 uluae

1 119282

2 119284-285

3 119289

4 119311

5 119408

119302 } - 119306

119303

119304

119305

119306

119167 } - 119171

119168

119169

119170

119171

concolor

119253-259

254

255

256

257

258

259

119223

119307

119268

119270 } - 271

119271

119274 } 119278

119275

119276

119277

119278

6 pygmaea

119261

119263

119266-267

119172

119373

119407

121530

Complete ulnae

119287

119288

119280

119281

Cedrus

OK

119283

119286

Mullein

119279 degen

119282 indet

filiae

119294

119295

119296

119371

121531

119173

119178

~~119179~~

larvi

119297

119299

119300

57

Noz in list not located
 per ~~hummer~~ 119273 (could be 119225)
 Cedros? 3.
 119274 or 119250
 ?
 miller 18

hummeri indet 27 sp.
 20 ~~Cedros~~
 2 miller 53
 2 diguizis
 6 Cedros
 (30) ✓

When Zebra 119287
 119282

ulnae

Cedros 4
 miller 2
 indet 6
 drops 1

(13) ✓ OK

Tibia

miller 3
 indet 3
 (6) ✓

Scap. miller 3
 indet 6

(9) ✓

vent indet (1) ✓
 wrist (1) ✓
 pedal (2) ✓

cracoid (10) (1 uamp) indet

carpo

miller 1

indet 2

(3) ✓

radius

(1) miller

tarsus cedros 2

indet 3

(5) ✓

30

6

13

9

10

3

1

5

1

1

2

81

Eighty bones from locality LACM 4301 and one from locality UCMP

V68106 are assignable to this genus.

includes the 2 from SDSM
bones are given

at least tentative specific
assignment.

milleri 13

cedros 12

diag. 4

29

54

83

88

39

47

54

Loc L Km 4301 Total 54

54 *Truncatella* sp. indet. Total 56

20 Hammer

8 Shells - 119277 (no end)

Dist rt - 119309

Prox left - ¹¹⁹³⁰¹ 119302, 119303, 119304

Shell only - 119170, 119274 (RT)

9 Distal

Left 119270 (h. 6.4) 119271 (h. 6.5)

Right 119167 (h. 6.75), (max. 119168, 119407 (h. 7.1))

diag. left 119305, 119169 (h. 6.7)

Right 119275 (h. 6.7), 119278 (h. 6.4) no.

? Miller left 119372 (h. 5.7)

3 Prox.

Top 119171 (cant meas h.)

Sept 119268 (h. 7.16.9 - eroded)

RT 121530

6 Ulna

Dist rt 119289 (diag. h. 8.6)

Dist left 119285 (diag. h. 8.5), 119284 (h. 7.8) 119311 (pathol. body) h. 6.8 m

prox rt 119408 (cant meas)

no. left 119286, 11 7

9 Cradoid

RT ^{no head} 119307, 119223, 119256, 119257, 119258

dist ? — RT head 119259 diag for cedarz says cedarz diag. smile

Left no. 119253, 119254,

dist ← RT head 119258 diag for cedarz says cedarz diag. smile

5 Tibia shaft dist) lat 121531

Left dist 119371 (dist h. 8.0) consider Miller? 119295 (h. 8.1) Miller?

RT dist no 119296 (dist h. 7.8.3)

Prox rt 119294

Scapular

RT 119244, 119247 (h. 7.3.3)

Left 119263, 119261 (h. 12.3) 119172 (h. 12.7)

May 15, 1981 Science - Reviews

Maucaella sp from 4301

3 Taromela, prox rt jug. 119297

dist rt jug. 119300

shat rt 119299

2 Carpinotocentz

Rt prox 121530

lt " 119291 ~~cont~~ depth 9.7

1 Thoracic vert 119252

1. Wing phalanx 119295

2. Pedal phalanx

Maucaella ? 119308, 119309

San Mateo study

re: *Manicella* sp.

Note distal end of *M. calif* from ^{#2577}1067 has less pectinate
 ectepicondylar prominence than *M. dieffeni* or *milleri*
 or *cedrosensis* but the space between this prominence
 and the ext condyle is ~~very~~ has a distinct swelling
 This area is longer & less prominent in the others

Prox. humeri from 4301

119171 - small frag. sp? size too large for *milleri*
 Capital groove wide [very narrow in *M. calif.*] head may be ended
 wide in *dieffeni*
 narrow with overhang in head in *cedros.*

119222

Very
 intricately
 #15367

also close

also close

also close

119222 has the deep oval area below head as in *cedros.*
 but head not as overhangy prox br. 18.8 through, pectoral area
 119273 same as 119222 but smaller prox br. 15.8 in pectoral area
 prox br. 18.6 tip of into prox. zone
 119269 " " " " " " " " " " " "
 119372 " " " " " " " " " " "
 " " " " " " " " " " "
 119224 " " " " " " " " " " "

It should be noted, however, that the four best preserved
 prox. ends of *humeri* #119269, 119372, 119222, 119273

That the best preserved prox. end of humerus #119222 bears close
 resemblance to type *cedros.* 15373 & referred 15367 humerus
 in the ^{definite} dorsal shape of the depression below the head on the ~~anterior~~
 side, a char. ~~diagnostic~~ *Cedrosensis*. Also apparent in
 the other prox. ends the preservation is not so complete
 include 119224 and very ones

Maucaella ? diegenensis

total 2

2

Prox rt poorly preserved

119279^{4?}

appears to be broader & shallower below head than cedronis
~~and has a distinct more radius~~

m. sp. ? — ulna rt. 119279 (length 31.7, br 6.1, dist 10.0)

22
30) 660
60
60
28) 59
2
29.4) 640
588
520
317) 610
32) 66
30) 72

283) 590
299) 630

Maucaella ? cedronis

total 19

Humeri nearly complete left 119169 (length 69.2, prox 17.0, dist 6.4)
gn. 70.0

Prox left 119222 (h. 18.9), 119269 (18.8+), 119224 (h. 17.4)

Prox rt 119273 (h. 17.3 mm), 119372 (16.6 for h)

Tarsometatarsus

Complete left 119298 (41.1 length, 10.1 prox br)

has the sharply defined borders of *M. mellea* & cedrus but

flares proximally as in cedrus

Shaft left 119174 sharply defined borders - size similar to cedrus 15354
least to shaft 5.9, mid 6.3+ (5.5 to 6.2+ cedrus)

Tibio tarsus

? (Dist left 119178 - dist int. lig. prominent & flared
far distally, robust at dist border But larger than any
cedrus specimen avail. depth int condyle 10.7, br dist 10.3+ (uni)

Ulna

rt 119288 (length 28.3, br prox 5.9) 119287 br prox 6.3, length 29.9

left 119280 (h. 30.7 br prox 5.9, depth 9.4) 119281 (length 28.9, br 6.0, depth 8.8)

Discussion.-- There are ^{five} ~~four~~ previously recorded species of Mancalla: Mancalla californiensis Lucas 1901 from the early Pliocene (Repetto Formation) of Los Angeles and Orange Counties; Mancalla cedrosensis Howard 1971 from the ^{early} ~~middle~~ Pliocene (Almejas Formation of Cedros Island, Baja California, Mexico; Mancalla diegensis (Miller 1937) and M. milleri Howard 1970 from the late Pliocene (San Diego Formation) of San Diego, California. ^{and M. elonga Olson (1981) inferred from} On the basis of size alone, at least two of these species may be represented in the material from the San Mateo Formation.

Two distal ends of humeri (LACM 119166 and 119272) with distal breadths of 5.5mm and 5.9 mm, two ulnae (LACM 119283 and 119286) with proximal breadths of 5.5 and 5.3 mm, three scapula (LACM 119262, 119264, 119265), measuring 11.6 mm or less in proximal breadth, the radius (LACM 119292) with a shaft depth of 5.3 mm, and a carpometacarpus (LACM 119290), depth of proximal end 8.9 mm, appear to fall within the size range of M. milleri (see Howard 1971:15). Most of the specimens, however, are larger and fall within the size range of both M. diegensis and M. cedrosensis.

The complete humerus (LACM 19165) and at least five proximal ends of humeri (LACM 119222, 119224, 119269, 119273, 119372) closely resemble those of M. cedrosensis as distinguished from those of M. diegensis in the broad, gradual curve of the internal contour of the shaft to the bicipital crest, and the deeply depressed, oval-shaped area below the head. Five of the complete ulnae (LACM 119279-119281, 119287-119288) show the protrusion of the olecranon beyond the shaft in ulnar contour, also characteristic of M. cedrosensis.

Depth shaft in radius # 119292 5.3 millim 4.6-5.6
Cedros 5.4-6.1
dieg. 6.3-6.4
California 119290 prox depth 8.8 millim 8.8-9.5 prox depth
by M 1 13.3 12.6-14.5 M 1

Scapula 119264 to distal end 11.6
119262 10.0
119264 to shaft below prox 5.0
119265 4.9
Miller 10.3-14.8
4.9-5.2

Notes on *Maunacalla* of *Pranauncalla* July 2, 1972 {*maunacalla* from San Diego}

L Acm 2670 - the outstretched largest humerus measures just short of 8.0 mm in distal br. (calyx flat on int. side of dist. end)

L Acm 42653 → 8.5 Type *P. victorae*

largest of 2 with 1st thrust UCM P 45856 same meas 7.3 mm

L Acm 2670 - br. shaft above estepicord. process 3.5

UCMP 45856 - " " " " 4.8

Pranauncalla L Acm 107029 " " " " 5.1 Pranauncalla from San Mateo formation

Pranauncalla L Acm 42653 " " " " 5.05 P. web. type

L Acm 2670 - br. prox 20.1 (great)

L Acm 2331 " " 19.8 "

UCMP Miller 2248 " " 19.3 "

L Acm 104287 " " 18.8 (UCMP 2480)

L Acm 2207 " " 19.4

Pranauncalla L Acm 107029 " " 21 at least Pranauncalla San Mateo form.

Pranauncalla L Acm 42653 " " 22.3 *P. victorae* Holbyke

L Acm 2670 - length to intercondylar sulcus (palmed) 83.4

" 107029 " " " " 81.0

Pranauncalla L Acm 42653 " " " " 81.0

L Acm 2670 br x depth sh below deltoid crest 5.3 x 10.6

" 107029 " " " " 5.0 x 9.8

" 42653 " " " " 5.1 x 9.5

L Acm 2670 depth sh. immediately above estepic. proc. 10.3

" 107029 " " " " 9.8

" 42653 " " " " 9.7

Conrad L Acm 39560 Length from lower edge scap. facet to ext. tip of sternal end 40.7

See 3221 Pranauncalla 39560 least lateral dimension (ant.) below scap. facet 7.3

37637 (victorae) " " " " " " 6.8

San Diego Mus from ~~Lower~~ ^{upper} level San Mateo - Maucalle

23 Coracoids

8 radii

11 carpomete

12 femora

13 tarsomete

17 scapulae

10 humeri good + 9 + 207

42 ulnae

SDNHM 23568 humerus length 62.7 mm = mean of Muller's
br. prox 15.7 = slightly gr. than mean of Muller's
Loc. 2947
coll. Prockmeyer

SD Tomahawk ^{from} 104279/1080
length 63.7 br. prox 15.84
was L. from 2096

SDNHM 23567

Length to withcond. 75.9 (gr. length 77.2) (72.4 in conoid type of Cedroserinus)

Br. prox 18.8
to below head 8.2 set pectoral fossa

prox br 17.5 "
(pub. seg 17.9) to below head 6.6
hatched

Has the internal contour of bicipital
crest forming nearly rt angle with shaft
not rounded into shaft as in Cedroserinus

area ^{below head} between pectoral ~~crest~~ attachment
pneumatic fossae broader & less
depressed (br. to 6 in Cedro type)

" 8.6 in 23567

Occurrence	area below head	7.2	prox to	19.0
119222	"	7.0		18.5
119269	"	5.5		16.6
119372	"	6.7		17.8
119273	"	6.7		17.1
119165	"	6.7		

119310 DiPh1 prox end 12.7 br. on 13.2 to greater swelling below
same diameter [♂] in Aquila 15.4 or 16.7
1760

Same diameter Buteo regalis 11 or 11.9
swelling extends farther distally than in Buteo - more as in Aquila

Pedal phalanx #119312 resembles this element in *Morus*
(right?) Ph1 digit 1 or 3? *Cassanus* - no larger
L prox 8.8

L prox *Cassanus* 6.8 mm

29% larger

Fragment of rt coracoid 119260 br 4301
br. glenoid facet 4.9 x 6.2 br
scap facet to top glenoid 9.8, depth thru shaft and 2 processes 7.8

C. columba 1174

humerus 68.5 coracoid above @ 4.5, (A) 6.3, (C) 8.7, (D) 8.1

C columba 1172

humerus 66.2 coracoid above (A) 4.4, (B) 6.6, (C) 9.1, (D) 7.7

has procoracoid ~~with~~ notched ^{4.6 mm} below prox tip

This notch is ^{4.0} 4.4 below in C. columba - sometimes a thin process
that breaks through ^{at edge} thus leaving a notch

61.6 from C. olsoni humer

66.2 - 69.2 in columba humer

The four best preserved prox. ends of humeri

- 119222, 119273, 119289, 119370 - strongly resemble

humeri of *Cedrosaurus* in the deep oval depression below the head, and gradual curve of internal contour from shaft through biapertural crest. With the exception of 119372, all fall within the size noted for *Cedros.* in prox. br. 119372 meas 16.8 (min. *Cedros* 17.0)

but ~~the appearance to lack~~ the int. contour is incomplete.

The nearly complete humerus 119165 also appears to resemble *Cedros.* tho the depth of the depression below the head is less marked.

Size 69.2 length, 17.0 prox. br. is close to the minimum listed for *Cedros*

119171, 119248 & 119274 are questionable (man calla sp. is far enough)

No distinction has been noted for distal end of humerus.

Humerus 119166 is presumably *milleri* based on size

Two other ~~humeri~~ *humeri* in coll. thought to represent *milleri* because

size and dist. humerus 119164 (br dist 5.4, *milleri* 5.1-6.0)
and " " 119272 (" " 5.8 " " ")

Also on size, scapulae 119242, 119245 & 119269 are *milleri*
not measurable but appear to be smaller than

also two dist. tibiae 119295? (*milleri* 6.5-7.9
8.0
conclude
Chazins

inc. ulna 119286 - br prox 5.3 (*milleri* 4.5-5.7)

1192837 - " " 5.5

length 27.0 (*milleri* 25.6-27.0)

prox carp. left 119290 - depth thru M1 8.9 (*milleri* 8.8-9.5)

prox half radius 119292 - gr depth shaft 5.3 (*milleri* 4.6-5.6)

★ IMPORTANT ★ Measure Thoracic vert. from 4301 and

trabec. type of *Cedrosaurus* 15373. See also

Cedros 15425 Thoracic #3 used in comparison with *Pranmaucalla*.

★ Meas. dist. br. of humeri of *Cedrosaurus*

OK

4301

length centrum 9.8

br ant 5.9
br post 5.4
dist ant 5.6
dist post 5.75

Cedros 15373 length 8.6

5.6
5.4
5.8
5.45

length centrum 6.5151
br ant 4.5 depth 4.9
br post 4.5 " 5.7

6.5147
25.373
8.85 length
br 5.1 dist 4.9
br 4.5 dist 5.6

Upper end chacois 119255 left + 119259 it resembles
digeus rather than cedrosensis. Lunula facet does not
overhang shaft as it does in cedrosensis

LRC in loc 4301

Of the numerous specimens ^{or manually} from the upper level at Ocean side, fine prox ends of humeri bear striking resemblance to the humeri of M. cedrosensis in char., as defined for that sp. ^(# 1971: 11) none.

Left 119269 }
119222 }
119224 }
rt 119273 }
119272 }
"Humerus with internal contour from shaft through
lateral crest broadly and gradually curved; area
below head, between pectoral attachment & pneumatic
fora oval & deeply depressed."

Possibly also assignable to M. cedrosensis as this is a
left ulna 119279 which is a stocky bone with a
more prominent olecranon than in M. diegeni. Also
distinguishing it from diegeni is the more prominent short
ridge beneath the int. cotyla which forms a U or V shape
by joining the similar ridge from below the ext. cotyla.
The int. ridge is ^{absent or at best very slight} ~~less developed~~ in diegeni, ~~though~~ it is
present in the smaller M. milleri.

Questionably assignable to cedrosensis is another stocky
left ulna #s 119282 ~~ulna~~ in which the int ridge
is developed below the int. cotyla. The olecranon is massive
in this specimen. Left ulna # 119280 has a deep depression
on the int side of the olecranon setting it off from the cotylae
& giving it prominence. ~~119280~~ 119280 is less stocky but
is close in size to cedrosensis # 15372

	15372	15371	15370	15369
length	30.6	31.4	30.6	28.9
prox. h.	6.0	6.9	6.9	4.5
br. sh	3.6	4.0	3.9	4.1
dist. sh	6.0	5.8	6.2	6.25

Tibiotarsus - left dist # 119178 has the budge intact
The int. papilla is near the distal edge & is prominent
Gr. at least 10.7 mm is 1 mm greater than the largest of the 5 cedros.
4. 119178 but within the range of diegeni. Very possibly
cedros had a greater range than these 5 show (diegeni 8.2-10.7)
The same span in cedros would allow up to 11 mm

94) 9240
860
846
190
tibiae cedar dist
9.4 br
8.6 depth

10.7 br
9.0 depth
larger tibia
diegeni

84%
107) 900
846
440

107) 1050
963
870

be dist humeri mileri San Diego

dist humeri
diegense from San D

2540 - 5.1

2096 - 5.9 = 104279 norm

2326 - 6.1

2219 - 6.0

2850 - 5.8

mileri

104287 - 6.4

2695 - 6.5 +

2670 - 8.0

10758 - 6.8

dist be
humeri

cedus 7.0 type

humeri dist from 4301

119166 - 5.8 mileri?

119278 6.4

119275 6.5

119168 7.0

119167 6.7

119271 6.8

119270 6.35

119272 5.8 — mileri?

Comp. 119165 6.5 length 69.2
prox 168 cedusami?

119407 - 6.9

not mileri

San Mateo from Oceanside coll'd April 1979 & donated to museum

2 left prox humeri 4 left dist humeri
2 rt prox humeri 2 rt dist humeri

10

Distinguish from *Mauvalla digenea* & *milleri*
by contour from shaft to bicipital crest more gradually rounded and area of origin of ext head of triceps below humeral head oval in shape & well depressed.

on dissep. } This area is broader, less depressed & chondrolytic ampulla
& miller } at junction of head & pectoral attachment.

3

1 complete left tarsometatarsus
incomp left shaft
5.3 br
3.3 depth
1 frag at dist
length 41.5
prox br 10.2
dist br 7.4
2 trochlea
gr dist br 10.0

San Mateo

6.0
5.1

Specimen coll'd by
L. H. M.
#119174/4301
length greater than
those coll'd later

Cedron # 15374/65151

length 42.0 prox br. unc.

dist br 5.7

gr. sh depth 5.1

dist br (2 trochlea) 7.2

Cedron # 15425/65144

37.3

4.7

3.8

6.8

38.6 (#23739/65144)

4.9+

4.17

gr. h 9.3? dist

9.0 gr dist
dist br 7.0 (incl)

San Diego Tarsi 105053 + 105054 loc 1128

105054 { br 4.6
depth 4.5
dist br 7.0

105053 length 37.0

dist br sh 4.37

gr depth sh 3.8

prox br 10.4

sh length 5.1

gr. depth 4.0

UCM P San Diego

3

1 prox left carpus 119290
length M1 13.3 as in miller
depth M1 8.8 as in miller

1 rt dist end

br sh 3.0 (miller's 2.8)

2 1 larger prox carpus

1

1 wing phal. Dig. 2 Ph 1

1

1 Tharsus vent

Check trochlear crests of carponota.
int. crest come down onto M3
in *Cedrosensis* (old notes)
& both crests said to be more
marked than in *digenea*

ulna

5 nearly complete left

2 " " " " " "

2 dist left

1 dist rt

1 incomplete left (has prox end + shaft - part of dist)

Left lengths	32.3	prox 82.1^{90} 7.0+	prox dist 10.2	dist depth 7.5+	sh to 4.5 midl
	36.9	19.7^{90} 6.0	9.4	7.25	3.7
	29.1	19.9^{90} 5.8	9.2+	6.6	3.7
right	?	5.4+	8.5	—	3.1
	—	6.5	—	7.15	3.95 (4?)
	27.9	19.7^{90} 5.5	8.5	6.25	3.35
	—	—	—	6.45	—
Dist	—	—	—	—	—
right	30.1	21.2^{90} 6.4	9.1+	6.8	4.0
	29.0	20.6^{90} 6.0	9.3	6.6	3.7
dist	—	—	—	7.3	—

collected by Larry Danielson over several yrs last time April 1979

Maucaella cf cedroensis prox humeri left 119269, 119222

rt 119273

ulna left 119279

M. ? cedroensis nec left humeri 119165 (mus. coll.)

left prox 119268 Larry Danielson

rt prox 119274 " "

M. cf. mulleri left prox carponeta 119290 (Danielson)

m cf " left ulna 119285 prox 5.4

left ulna 119280-119285 } Maucaella sp. } too slender for cedroensis?

rt " 119287-119289 } Maucaella sp. }

left dist humeri 119270-119272 (3) } m. sp.

rt " 119275-119278 (4) }

See next page

San Mateo 4301

Leg Bones
UPPER LEVEL

Tibia tarsus distal left 119173 br. 9.7 + (Given int'l.)
to Cedreus H 15374 p. 11

" distal internal lip. prominent a distinct rounded papilla below level of prox. edge of int. condyle, ext. lip. prom. negligible."

p. 12 " on the tibia tarsus the distal int. lip. prom. is more prominent than in either cedreus or milleri but seemingly is close to the latter in placement below the level of the prox. border of the condyle; poor preservation of the San Diego specimen somewhat obscures the exact position of the prominence. The ext. lip. prom. is negligible as in M. milleri."

L tibia 119173, dist. left from L tibia 4301

has the int. prominence close to the dist. border of the condyle as in M. cedreus though the specimen is larger than in specimens of Cedreus avail.

depth int. condyle 10.8 mm (type cedr. 8.8 mm.)

br. condyles 10.2 + (" " 9.4)

br x depth 6.9 x 4.0 mm → 6.3 x 3.8 cedr. type
sh distally

Tibia # 119295 br. 8.1 mm. (min cedr. 8.0) falls within milleri
Tarsometatarsus 4301 shaft
119174

Tarsus 2178
San Diego
length 43.5
max 10.7
dist 10.0
sh 5.4
2178, 7.3

least br sh 6.0 (Cedr H 15374 - 5.6) m. diag. 5.2
depth same place 4.6 (or up to 5.3?) 4.2

deeply excavated ant'ly as in cedr.

gr depth sh ex 5.3+

cedr - 5.0 m. diag. 4.8
15374 2178

4301 11928 length 41.3, max 10.2, dist 10.0 to sh 5.1, 2 dist back 2.3 ext depth sh 4.4
cedr 37.3-42.0-9.4-10.2-8.9-9.3 (Cedr 4.8-5.6) - Cedar 3.4
15374

Tibia 119371 br dist 8.0
depth 8.1

OVER
MORE TARSUS

4301

Humerus 119372

Cedrorhinus P. 11

" Humerus with contour ~~from~~ from shaft to
 bicapital crest broadly and gradually curved; and
 below head between pectoral attachment &
 pneumatic fossa oval and deeply depressed."

Copied
 on
 WING BONES
 SHEET

This diagnosis fits # 119372 exactly.

Humerus last prox br. quinifus cedrorhinus is 17.0

and # 119372 measures only 16.6 mm. (fits of int. radi
 before could add the
 extra .4 mm ?)

19222 br prox 18.9

119273 " " 17.8

119269 " " 18.5

119224 17.5 (pneumatic fossa var.)

Tarsus

4301 length 41.5

119298 prox 16.2

least sh h. 5.0

ext depth sh 4.4

dist br
 2 trochlea 7.4

on dist br. 10.8

4301/119174
 43 + (var)

6.0

5.3

10.2
 12.175

depth

43.5

17.0

5.3

4.8

Cedrorhinus

43144
 15425

37.3

10.0

4.75

3.8

6.8

9.3

45132
 15402

8.9

4.5

4.1

7.2

63.51
 15374

42.0

5.7

5.1

7.2

See also page
 of 1979 collection
 donated to Museum

T. barbaensis prox var, st. much less flattened through shaft than P. mananilla

[cedr 15425 - 6.6] or 6.0 through fibular crest - br sh below fibular crest - 5.6 [cedr 15409 also 5.6]

[cedr 15409 - 4.8] depth 4.8 at same place

[cedr 15425 - 7.0] anterior face raised in long ridge. M. milleri flat ant'ly

length bone 72.8

2549, 76.5, br sh 5.3, depth 3.6

cedr has slight ant ridge but is broader 7.5 x 4.9

Measurements of <i>Mauvalla bonis</i>		from 1067	assigned	M. calif. also higher wet & dry.
cr type from h. Ad (humus)		P. wettime	P. dry	
<i>Humerus (calif) *</i>		turn photo	—	
length to end		58+? mm	—	
deltoid ^{to tip} 51.9			—	
br. prox. 19.4			—	
br. x depth			—	
sh above		5.1 x 9.6	5.1 x 7.7	
erlept cond. 4.7 x 10.2		?	7.8	
br. dist condyle		8.5	—	
depth humer. 10.3 - 12.4		10.1	—	

<i>Coracoid</i>				
Scap. facet to head 18.8		20.4 mg.	18.8	
Pr. furcular facet 8.7				
Ht furcular facet at tip 5.1				
Pr. three trochlear canal 5.9		5.4 - 6.3	5.8 mgul 5.6 S. Mat. 5.1 mat. 13.9	5.9 13.0 ap.
Scapula Br. prox		12.5 - 14.4		

<i>Ulna</i>		28.0 - 32.1	36.6	
Length			5.8 mgul	
Depth prox 10.7		9.0 - 9.3	5.1 mat (11.3)	
Br. prox. 6.7		5.9 - 6.4	7.5 S. Mat.	
Depth sh			mgul	
			35.8	

<i>Radius</i>				
gr. length 29.7		6.3 - 6.4	5.8	
gr. depth sh 6.8				

<i>Carporach acachus</i>			mgul Scap. mated	
gr. length 41.3		38.0 - 37.2	(36.3)	
Ht process M 17.7		15.2 - 15.5	15.7 (15.0)	14.0 - 14.1
gr. depth prox } 11.0 - 11.8		19.7 - 11.0	7.12.1 (11.4)	11.9
Ht M 1		4.6 - 4.7	5.4 (5.1)	5.0 - 5.2
Br. prox trochlea 4.8 - 5.1		3.1 - 3.7	4.3 (4.0)	4.0 - 4.7
Br. on M 1		(3.4 - 3.6?)	Scap. Mat.	
tibia est. length 87.5		81.0 - 98.5	105.1	
prox br. 8.6			13.5	
Br. dist 6.7		8.2 - 10.7	7.9	
least sh br.				
Tarsus. length to ext. tip 39.3 ext		38.0 - 43.6	40. max ext	47.5 ext
dist. br. 9.3		8.8 (10.3)	11.6	
prox br. 9.9		8.7 - 10.7	12.1	
sh to middle 4.8			6.1 least	

unidentifiable *Mauvalla* as to species

Distal ends humeri

119167, 119168, 119169, shaft 119170

Prox humeri 119171

dist complete humeri 119165 ✓ concolor *diegensis* 69.1 prox 17.1

rt prox 119279 ✓

dist prox 119268 ✓ concolor *cedrus*,

left scap 119172 ✓

rt scap 119266, 119267 ✓

rt scap 119373 ✓ concolor *milleri* ~~or *diegensis*~~ 69.12.4

left scap 119261, 119263 ✓ size 12 for *diegensis* & *cedrus*

rt dist humeri 119275, 276, 277, 278 ✓ ^{short} ~~at 119407~~ _n *diegensis* & *cedrus*

left " " 119407 ✓

1979 rt ulna wic prox 119408 ✓ called by Welton & Porter May 26, 1979

rt carpo. 119291 ✓ size 12 for *cedrus* & *diegensis*

left humeri shaft & dist 119270 ✓

" " dist end 119271, 72 ✓

left ulnae 119280, 81, 82 ✓

119165 - data? comp humeri

IDENTS. ★

Mauicalla milleri Gaudin 11916

shaft + dist end humer 11916 ✓ (br. 5.5 dist hooked milleri)

dist left tibia 119371 ✓ br. 8.2 diegeni

? left ulna 119281 ✓ 28.5 x 5.9 (diegeni) 8

left ulna 119283 ✓ length 27.2 br. 5.5 (max milleri 27.0 + 5.7)

left ulna 119286 ✓ br. 5.3 (dist end broken) milleri 4.5-5.7

carpometacarpus (left) 119290 ✓ depth prox end 8.9 (milleri 8.8-9.3)

prox left tibia 119294 ✓ (size) sh br. 5.6

dist tibiae rt + left 119296, 119295 (br. 8.1) between diegeni
(br. 8.4 +) + milleri

left scapula 119262 ✓ - 10 + max milleri

119265 ✓ - 9.5 max + even smaller than milleri

119264 ✓ - 11.6 max milleri

OK Radius 119292 ✓ - greatest depth shaft 5.3 (m. milleri 4.6-5.6)

dist tibia 119371 ✓ dist br. 8.2 = diegeni

dist br. milleri from S.D 6.1, 5.8, 5.9, 5.2

Mauicalla cedroensis

humeri prox 119269 ✓

119222 ✓

119273 ✓

119372 ✓

119224 ✓

ulna 119279 ✓ - 31.7, 6.75 max determined to olecan

size ok ? 119280 ✓ - 30.3, 6.0. "

? tibia dist 119173 check genus

tarsus shaft 119174

? check number

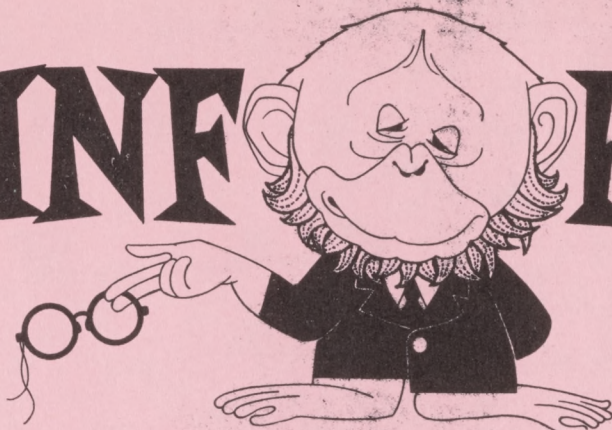
Whale of 4301	length top of style to end of style	to pub	depth max	depth dist ext.	ap. depth sh mid	fish mid
<u>65153</u> 15394	28.4	6.15	10.1 (10.0) ^{int.}	7.5	6.6	4.2
15399	29.4	—	9.8 ^{int.}	7.3	6.4 ^{int.}	—
* + 15398	31.65	6.7	10.0 ^{int.}	7.1	6.25	4.0
15396	30.9	6.6	—	7.7	6.35	4.1
<u>65148</u> 15414	31.3	7.15	—	7.8	6.7	4.1
15415	29.4	6.45	—	7.4	6.45	4.2
<u>65149</u> 15372	31.4	6.9	9.9 ^{int.}	7.25	5.9	4.1
<u>65144</u> 15424	29.95?	6.55	—	7.9	6.0	3.85
4410 15373	29.2	6.3	9.25 ^{int.}	7.45	6.2	4.2
<u>65154</u> 15371	30.5	6.85	10.2 ^{same}	8.25	6.35	3.9
* — <u>65142</u> 15411	28.3	6.2	8.9 ^{same}	6.5	5.6	3.9

m. delphinus	28.8	6.5	9.3 ^{same}	—	6.3	3.9
2323	32.0	6.4	—	7.7	6.75	3.9
2064	37.74	5.8	—	7.0	5.85	3.95
2287	—	6.45	9.0	—	6.15	3.85
2248	—	—	—	—	—	—

m. milleri	25.15	5.3	8.3	6.4	5.4	3.25
119767 (new)	26.2	5.2	7.5	6.4	5.15	3.45
<u>1074 B</u> 6426	26.7	5.2	8.2	6.2	5.55	3.35
X <u>1080</u> 2439	25.2	5.7	8.2	6.2	5.3	3.3
a 1128/2497	24.8	4.9	7.4	6.3	5.55	3.3
b 1128/2497	26.0	5.3	8.6	5.9	5.5	3.0
2484	25.6	4.9	7.7	6.2	5.65	3.2
<u>1082</u> 2832	—	5.3	7.9 +?	—	—	—
2342	23.5 +?	4.6	—	5.7	4.8	2.8

4301	31.8	6.7	10.1	7.5	7.0	4.55
X + 119279 flav	29.7	6.2	9.15	6.8	6.2	4.2
119287	28.4	6.0	9.1	6.65	6.1	3.85
flav 119288	30.4	5.9	9.4	7.05	5.9	3.6
flav 119280	28.5	5.8	8.9	6.6	5.6	3.7
X flav 119281	—	6.75	—	7.2	6.45	4.1
119282	27.3	5.5	8.55	6.25	5.35	3.4
milleri 119283	—	5.4	8.45	—	5.0	3.1
" 119286	—	—	—	—	—	—

THE INFORMER



AUGUST, 1979

Mon 20

Tue 21 3:30 PM Division Heads Meeting Dir's Office

Wed 22

Thur 23

Fri 24

Sat 25 2:00 PM Saturday Film Series - "THE Aud
OF THE NIGER" - color - 50 minutes
(Mr. Durham)

7:00 PM Rams vs. San Diego Coliseum

Sun 26 2:00 PM MUSIC PROGRAM - Mermaid Players Aud
(Mr. Lipscomb)

VCMP
 Cracoid 88614 from loc 68106 (= L. rem 4301) Mancalla

- a length to eroded heel 45.5'
 b length to scap facet 33.9 from near nit. tip (tip missing)
 c' br. glenoid facet 6.0, length same 8.6? c² 69% (c'/c²)
 d down vent depth 5.2/6.3 through glenoid facet over above scap base
 e lateral dimension 5.2 near below glenoid on ventral (2 ant) surface
 1590 of B

Same dimensions in cedrosensis

	type	15410	15400
a	43.4	44.8	—
b	31.5	33.0	35.3?
c'	5.9	6.3	6.1
c ²	9.1?	10.0?	8.5?
d	6.0? 90%	6.1 91%	6.4
e	5.2	5.6	5.4
c'/c ²	60%	63%	71%

Same dimensions M. digress + milled

	2047	45863 dug	46028 milled	2087 dug.	2310 dug
a	50?	49.1	43.8	46.8	48?
b	36.6	34.9	31.9	34.5	35.8
c'	6.3	5.3	5.5	5.9	6.0
c ²	10.4	9.3	8.6	7.7	10.4
d	6.1 90%	6.5 92%	5.5 89%	5.0 91%	6.9 89%
e	4.9	6.0	4.9	4.7	5.8
c'/c ²	60%	56%	63%	76%	57%

cracoid

Tarsus 119174
 deeply depressed
 ant'ly: "Trough"
 between ext + int sides
 int. side shaft

gr. depth ext. side sh. 5.3 m
 br. same place 6.3
 least br. 6.1

ext side shaft raised into
 sharp ridge, int. side raised,
 slightly but convex raised a little
 raised area above trichia 2. Seems to
 go up + blend with the convex edge of int. side
 of shaft. This is not clear in cedros or
 digress

Cedrosensis gr. depth 4.2, br. same place 5.3 least br. 4.9 length 38.0

25739
 15414
 Cedrosensis
 65148/15418

gr. depth 4.3 breadth same place 5.6 least br. 5.4
 more depressed ant'ly than 15414

Cedrosensis
 65144/15425

gr. depth 3.7 breadth same place 5.1 least br. 4.8

VCMP 45852 digress gr. depth 3.9
 L. rem 2178 " 4.4

" " 5.3 " " 5.1
 " " 5.8 " " 5.5+

Side of 2178 (length is about like 119174 but int. edge of shaft
 is less rounded + raised



AMERICAN GEOLOGICAL INSTITUTE

5205 LEESBURG PIKE FALLS CHURCH, VA. 22041

703-379-2480

10 April 1979



Dear Colleague;

We are interested in establishing an informal organization for women geoscientists in the Los Angeles area. You have been identified through membership lists of various local professional societies or the Roster of Women in the Geoscience Professions, published by the Women Geoscientists Committee. At present, we perceive any attempt at organization to be exceedingly informal. The main purpose will be to allow us to identify ourselves, meet each other, and open lines of communication and support. If the group desires, more formal meetings or programs can be arranged, or we can continue to meet informally.

Our first meeting is scheduled for Sunday, April 29, 1979, at 11 A.M. We will meet at the Golden Dragon Restaurant, 680 North Broadway, Chinatown. Directions are attached.

Please phone in reservations or notice of interest to one of us by April 27.

We feel there is a great need for a gathering of women geoscientists in the L.A. area. We hope you feel the same need and will respond to this invitation. Please pass this letter on to the other women geoscientists you know, so they can plan to attend also.

Sincerely,

Nancy J. Banta

Nancy J. Banta
Staff Geologist
Getty Oil Company
(213) 381-7151

Denise D. Pieratti

Denise D. Pieratti
Staff Geologist
Woodward-Clyde Consultants
Secretary - Women
Geoscientists Committee
(714) 634-4440
(213) 581-7164

4301

Tarsus # 119298 resembles cedrosensis in more sharply defined anterior border of shaft than in diensis

Size equals both diensis & cedrosensis

length 41.0	cedros. 37.3-42.0	diensis 38.0-43.6	milleri 31.1-36.0
prox br 10.1 (or 10.2)	cedros. 9.9-10.9	diensis 8.7-10.7	" 7.2-8.4

(type 10.2)
only part of tarsus in type up prox.

blumeni tars

left 119222	ap 119249	rt 119273	rt 119372	rt 119224
19.1	18.6	18.0 (inc ext)	17.3? (inc ext)	17.4

diensis 17.3-20.3
cedros. 17.0-20.1
milleri 14.2-16.4

whorae diensis # ¹⁰⁸⁰ 33665 length to outer cot. ridge 31.5
to internal cot. ridge 28.1

whorae type cedros. cot. ridge - 29.1 16.3 br prox
int cot. ridge - 18.3 19.2 depth "

San Mateo

left {	119279	outer cot. ridge 31.5	prox br. 6.6	has large attach outside int. cot. ridge
		internal cot. ridge 28.2	prox depth 10.0	
	119280	length 30.4	9.2 depth prox	
		20.6	6.0 br. "	
left {	119281	28.5	8.8 depth	
		26.8	5.7 br	
rt {	119287	length 29.6	9.0 depth prox	
	119288	26.6	6.2 br "	
	119288			

USE May 15, 1981

Assign to ? cedrus.

Humerus
 rt 119372 blunt note prox br. 16.6 (cedrus min. 17.0)
 humerus 119372 broken internal tubercle & edge of brach crest

left 119222 ✓ br 18.9

rt 119273 ✓ 17.3

left 119269 ✓ 18.5

left 119224 16.9 - 17.03
 lateral brach crest but oval depression below head

left 119248 ? 17.0 oval dep. poorly preserved proximally

rt 119274 ? suggest oval depression but poorly preserved

Ulna

rt 119288 → length 28.3 from intercotylean notch to dist. int. side (= rare in cedrus)
 has ulnar bend of olecranon as in cedrus (olecranon more prominent)
 br. prox 5.85, depth prox 9.1

match
 cedrus 15411
 loc. 65142

left 119281 → length 28.5 br 5.8 - depth 8.6 - olecranon flares ulnally
 " 30.3 br 6.0 " 9.5 - " " ?
 left 119280 - " 31.7 br 6.7 " 10.0 " " (broken)

left 119270 - " ? ? ? ?
 left 119282 - " ? ? ? ?

rt 119287 length 30.8 - br 6.3 depth 9.1
 length 41.1 (= both diag. cedrus) but dist. not more strongly defined than dist. ?
 br. sh 6.4 (cedrus 6.1) (#15374) 65151

Tarsus 11928
 119174

Assign to mellei on size

left carp. prox 119290 length 11 13.3, depth prox end 8.7
 (mellei 8.8 - 9.5)
 mellei 12.6 - 14.5

left humerus 119272 br dist end 5.6 (mellei 5.1 - 6.1, depth 6.0 - 8.0) or 7.4
 119166 " " " 5.6

Scap 119269 br 11.5 mellei 10.3 - 11.8
 sh 5.4 (this 4.0 - 4.5)
 (119265 & 119262)
 with prox carpi

left ulna 119280 prox br 5.2 (= mean of mellei)
 " depth 8.7 (= max. mellei (7.4 - 8.5)
 (min. diag = 8.9 - max 10.3)

radius 119292 depth sh 5.1

Total of ¹⁰ ~~9~~ condyles counted for one furuncle
 9 lcm, 1 cm
 (add 119307?)

119172 tibia br. post. br. 8.3
 ant br 10+
 depth 10+ (10.6 int. condyle)

cedrus type
 br. dist post'ly 7.8
 " " antly 9.2
 depth dist 8.5 (8.5 int. condyle)

Longest cedrus br. 9.5 could be max of 10.5 br.
 based on sizes in diagenese or 9.9 based on tarsal br. in cedrus

$$8.2 : 10.7 = 9.0 : X$$

$$8.2X = 963$$

$$X = 10.5$$

$$\begin{array}{r} 10 \\ 8 \overline{) 21963} \\ 82 \\ \hline 430 \end{array}$$

$$9.9 : 10.9 = 9.0 : X$$

$$9.9X = 9810$$

$$X = 9.9$$

$$\begin{array}{r} 981 \\ 99 \\ \hline 820 \quad 99 \\ 99 \overline{) 981} \\ 891 \\ \hline 900 \end{array}$$

humerus
 $17.0 : 20.1 = 9.0 : X$
 $170X = 18090$
 $X = 10.$

Mancalla?cedrosensis Howard 1971

Material tentatively referred.-- nearly complete humerus LACM 119165, 3 left proximal ends of humeri LACM 119222, 119224 and 119269; 2 right proximal ends of humerus LACM 119272 and 119273; left ulna LACM 119279; ¹¹⁹left distal end of tibiotarsus LACM 119178.

Discussion.-- The humeri resemble M. cedrosensis as originally described (Howard, 1971:11) "Humerus with internal contour from shaft through bicipital crest broadly and gradually curved; area below head between pectoral attachment and pneumatic fossa oval and deeply depressed." The ulna is a stocky bone with more prominent olecranon than in M. diegense. It is further distinguished from ulnae of M. diegense by a more prominent short ridge beneath the internal cotyla forming a "U" or "V" shape by joining a similar ridge from below the external cotyla. The internal ridge is absent or, at best, very slightly developed, in ^Mdiegense. ~~xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx~~
Tibiotarsus LACM ~~119178~~ ^{the three} 119178 is larger than ~~any~~ available specimens of M. cedrosensis. Tibiotarsus 119178 has the internal papilla near the distal edge of the lateral surface of the ~~primary~~ ^{five} secondary as in cedrosensis. It is, however, larger than any of the ~~three~~ available specimens of M. cedrosensis but within the range of M. diegense. Possibly M. cedrosensis had as great a range in size

In almost all the preservation is such that specific determination is questionable. However, 5 mos and human closely resemble those of *M. cedrosensis* and are distinguished from those of *M. digressus* in the broad, gradual ~~curvature of the~~ curve of the internal contour from shaft to bicapitulum crest and the deeply depressed oval shape of the area below the head between the postoral attachment to the pneumatic foramen. ~~Also~~ ^{Also} ^{only human comp. human 119165 appears to have transverse diameter, less than 69.2 in ^{very near} for. Cedros. 69.5}

Also distinguished from *M. defensor* & *M. cedrorum* is an incomplete distal end of third tarsus in which the ~~to~~ internal ligament prominence is not only more prominent than in *M. defensor*, but is placed more distal in placement, ^{distal (19.4 mm approx)} ~~on avg~~, ~~however~~ the specimen (L 2 cm 44 11/9/73) is larger ^(the distal end of the tarsus) than any of the specimens on cedar island. In view of the ^{significant} ~~comparable~~ in brs of prox tarsus + ~~distal tibia~~ of *M. defensor*, ~~but~~ in *M. defensor* & *M. cedrorum*, ~~it is a~~ a comparable range in dist br. of of third tarsus would be expected. Hence a br. of, at least 10.7 mm (h. exposed) ^{41.2 T cedar.} is usual in legs of *M. defensor* rather than *M. defensor*.

A complete & also, (leaves) suggest cedros, rather than dielfense
~~with~~ has the prox or dist flange of dielfense as contrasted with
 more columnar shape of the smaller M. milei but the shaft seems
 more depressed than in dielfense thus tending toward cedros.
 (dist. sh. 90) (25, 470^m dist to leaf 18.5th 2nd leaf to dist)

check
#2091
after 104278
rec'd.
ced

cf
Mancalla cedrosensis Howard 1971

Referred material.-- A ~~near~~¹⁶⁴ complete humerus, poorly preserved LACM 119265, 4 proximal ends of humeri, LACM 119272 and 119273 (right) and 119222 and 119269 (left); 5 complete ulnae, LACM 119287, 119288 (right) and 119279, 119280, 119281, 119292, ~~119285~~¹¹⁹²⁸⁴; complete tarsometatarsus LACM 119298; left distal end of tibiotarsus LACM 119178.

Discussion.-- All of the specimens referred to M. cedrosensis are larger than the maximum recorded for M. milleri. ^{The humeri} They are further distinguished from ^M milleri as well as M. californiensis and M. diegensis as follows: humerus with internal contour from shaft through bicipital crest more gradually curved, and the area below the head between the pectoral attachment and the pneumatic fossa more ~~deeply~~ oval in shape and deeply depressed; ulnae with olecranon slightly protruded ulnally and with a deep depression adjacent ^{to olecranon} on the internal side; tibiotarsus with internal ligamental prominence more ~~proximal~~ more distally placed than in M. diegensis and more prominent. The tarsometatarsus has the proximal and distal flare of M. diegensis as contrasted with the columnar shape in M. milleri, but the shaft is ^{than in diegensis a bit} more depressed anteriorly ^{and the border of the shaft sharply} defined.

Measurements.-- ~~SDSN 423567 length 76.0, width 18.7,~~
~~and 119265 = 16.4~~
Measurements (in millimeters) humeri: proximal breadth 16.6 - 18.8 (M. milleri 14.2 - 16.4, M. cedrosensis 17.0 - 20.1)

Mancalla ? cedrosensis Howard 1971

Referred material.-- 1 nearly complete humerus, LACM 119.65,
4 proximal ends of humeri, LAC, 119273 and 119372 (right and 119222
and 119269 (left; 5 complete ulnae, LACM 119287-288 (right),
119279-119283 (left; distal end of left tibiotarsus, LACM 119178;

Description.-- All of the referred specimens are larger than
the maximum recorded for M. milleri and are distinguished from
M. californiensis, and M. diegensis as follows: humerus with internal
contour from shaft through the bicapital crest ~~gradually~~ more
gradually curved and the area below the head between the pectoral
attachment and the pneumatic fossa val and more deeply dep

+ auricula, 119298 (4301) edges raised on ant + vent
 calc ridge less squared % at their distal edge - center ridge elongated + narrow at base
 int ridge long
 Genus Mancalla Lucas 1901

Mancalla ?cedrosensis Howard 1971

Referred material.-- Proximal end of right humerus, LACM
 119222, from ^{119269, and left prox. 119273} Locality LACM 4301. Collected by LACM field party
 in 1977.

is distinguished from the humerus of Mancalla diegense and M. millei
Description.-- This specimen resembles the humerus of the
 type skeleton of Mancalla cedrosensis and referred specimens of
 the same element from the several localities on Cedros Island,
 Baja California, in the characters outlined by Howard (1971:12):
 from
 the contour of the shaft to the bicipital crest is broadly and
 gradually rounded and the area of origin of the external head of
 the triceps below the humeral head is distinctly oval in shape.

Description.-- This specimen is distinguished from the type
 humerus of Mancalla californiensis by the convergence of the ridges
 forming the muscle scar at the median border of the pneumatic fossa.
 and It resembles humeri of M. cedrosensis in the deeply depressed, oval
 area of origin of the external head of the triceps muscle below the
 humeral head, and in the broad, gradually rounded contour of the
 bone from shaft to bicipital crest. The bicipital area is more
 angular in external ^{the other 3 are}
 squarely outlined in M. diegense and M. milleri and the contour
 from shaft to bicipital crest is more abrupt.

+ auricula prox 1.8 # 119297.

10.1 119298 length 41.3 mid sh 5.1

119174 mid 32.4 " " 2.9

add 5.2

6.7

11.9

37.6

49.5 at least

Genus Mancalla Lucas 1901

Mancalla sp. indet.

Referred material.--From locality LACM 4301: nearly complete
1 distal half and 3
humerus, abraded proximally, LACM 119165; ~~4~~ distal ~~ends~~ fragments of humeri,
(LACM 119222)
LACM 119166-119169; 1 proximal end/and 2 proximal fragments ~~of~~
(LACM and)
~~xxxxxxxLACMxxxx119222x~~ 119224, 119171) of humeri ^{incomplete and}

Referred material.-- From locality LACM 4301: ~~4~~ fragments of
^{11945 and 119166-119171, 119222, 119224} and
humeri, LACM ~~119222, 119224, 119165-119171 inclusive~~; 1 proximal
LACM 119172 LACM 119173
end of scapula, 1 incomplete distal end of tibia, 1 shaft of
tarsometatarsus (LACM 119174), 1 fragment of coracoid (LACM 119223),
Collected ~~in~~ by museum field parties in 1977 and 1979.

From locality UCMP 68106, 1 incomplete coracoid, UCMP 88614,
collected by University field party in

Description.--The varying sizes of the humeri suggests that
most of
more than one species is represented. However, the bones are ~~xxx~~
poorly preserved ~~xx~~ and considerable
variability in size has been ~~xxxxxxxxxxxx~~ noted for the species
previously described (see Howard, 1971:15).

The best preserved humerus, a proximal end LACM 119222
resembles this element in Mancalla cedrosensis in the deeply
depressed and oval outline of the area ~~xxxxxxxxxxx~~ of origin of
the triceps muscle, below the humeral head. This area in M. diegense
and M. milleri is ~~xxxxxxxxxxxxxxxxxxxxxxxx~~ broader, ^{forms a 45° angle} rather angular
at its proximo-external edge, and less depressed, ^{forming a more 90° angle} The other two
proximal ends are too poorly preserved to provide the details of
this diagnostic area, though they are clearly distinguishable from
the genus Praemancalla ~~xxxxxxx~~ in which the bicapital area juts out
more markedly and the capital groove is a wide open angle.

The proximal humeri all resemble ~~Praemancalla~~ Mancalla, rather
than Praemancalla in the ~~deep~~ narrow capital groove & the
~~less angular~~ ^{deep} ~~proximal~~ ^{distal} ends
all have the small papilla ^{near} the top of the external condyle (which is lacking in Praemancalla)

br. 5.6

119272
C. 5.7

mens
this

(11 4.5-5.7)

11 10.3 - 11.8

Not - tubes dist 6.
referred 119295-119296
to Mullin
pug 119294

fibrae non
necesse

degeneris >
cedreus

radius of depth sh 5.3
119292

mulleri	4.6 - 5.6
cedus	5.4 - 6.1
duffy	6.3 - 6.8

San Mateo Is.
X = number of Baniastal

Truncella cf. cedrosensis

X also needed 119224, but now
considered too poorly
preserved.

X Prox right	119273	br. prox	17.4	lacking complete contour ext'lly of deltoid crest
X	119372	" "	16.7	lacking internal complete contour of biacromion
<u>number</u> X Prox left	119222	br. prox	18.5	
X	119269	" "	18.5	
Crope. Rt ulna	119288	length to olecranon	29.1	to styloid int condyle 28.9, prox br 6.0, depth prox 9.1
" " "	119287	" "	30.0	cut. surr + int. condyle 29.9 6.4 9.1
" left "	119280	" "	30.4	cut. surr + int. condyle 30.4 6.0 9.4
" " "	119281	" "	28.9	cut. surr + int. condyle 28.5 5.7 8.8
X? Miller as number Baniastal	119283	" "	22.7	22.1 5.5 8.5
Left	Type cedrus	" "	29.5	29.4 6.4 9.4
rt Cedrus	115371	" "	31.3	30.5 6.9 10.2
" " "	15411	" "	38.6	28.2 6.2 8.8
" " "	15394	" "	29.1	28.4 6.1 10.1
" " "	119279	" "	32.2	31.6 6.6 10.7
San Mateo left	4301			

119283 not as deeply indented (depressed) before olecranon int'ls? may be ok
but may be Milleri olecranon not as prominent as Cedrus?

Could be dieffenus - humerus 119165 length int 69.2 prox br 17

prox hum. 119274 br prox int 17.0

left ulna 119279 32.0 & 31.7 (lengths as above)
prox to 6.5 depth 10.0

Mancalla diegenae from Orange County		cat #?
Length humerus 73.6		(m. diegenae 71 - 84.2)
Ex pos? 19.2?		m. cedroensis 69.5 - 80.0
		m. milleri 56.4 - 66.6
Length femur 59.0?		(m. diegenae 53.8 - 57.0)
Tyl { Dist length type 53.9		m. cedroensis 54.7 - 56.5
m. diegenae { 2nd " " 56.2		m. milleri 45.0 - 51.1
Length coracoid 48.0		(m. diegenae 47.5 - 54.0)
		m. cedroensis 43.2 - 47.5
		m. milleri 38.5 - 43.5

Coracoid has prominently protuberant external contour of region from shaft to glenoid facet as in m. diegenae as contrasted with m. californicus from 121067 in which the glenoid facet area rounds off indistinctly from shaft.



Dist length	53.9
Ext "	55.7
Length fem	53.1
mid prox bet head + trichanther to intercondylar space (distals)	
Head to head	7.1
Scapula flat	510.3
Gr. + ach space	11.2
Depth troc	9.1
Length troc.	9.7
Gr. b. distal	10.8
Depth int cond.	7.4
Depth ex + cond.	9.4 ext, 10.1 med
Gr. sh above breast	4.5
Depth	5.0
Depth dist end	9.9
coracoid flat part	4

Ulna San Mateo Mammalla Loc. 2 Acn 4301

WING BONES

compared *M. diegensis* & *M. cedrosensis*

		interstitium under the int. distal	6	C	mod. y	distal	distal	distal
<i>M. diegensis</i>	33668/1080	1	7.2	10.2	4.2	6.9	5.9%	
	2323/1095	31.5	6.4	9.3	3.7	6.2	5.9%	
	2246/1079	32.2	6.4	9.0	3.8	6.2	5.9%	
<i>M. cedrosensis</i>	15411	28.5	6.3	8.9	3.9	6.2	5.9%	
	15394	28.3	6.1	10.1	4.1	6.2	5.9%	
	15415	29.8	6.4	10.1	4.3	6.2	5.9%	
	15398	31.6	6.7	10.0	4.0	6.2	5.9%	
	15414	31.2	7.1	10.3	4.1	6.2	5.9%	
	15371	30.5	6.8	10.3	3.9	6.2	5.9%	
	15424	30.3	6.5	10.3	3.8	6.2	5.9%	
	15372	31.4	6.9	9.9	4.1	6.2	5.9%	
	15395	30.9	6.6	10.3	4.0	6.2	5.9%	
LAcn 4301		ya						
	119280	30.3	6.0	9.4	3.6	6.2	5.9%	
	119288	28.4	5.9	9.1	3.6	6.0	5.9%	
	119287	29.8	6.3	9.1	4.0	6.2	5.9%	
<i>M. diegensis</i>	119279	31.7	6.9	10.1	4.5	6.2	5.9%	
<i>M. diegensis</i>	119283	27.2	5.5	8.5	3.4	6.2	5.9%	
<i>M. diegensis</i>	119286	27.2	5.5	8.5	3.4	6.2	5.9%	
	119281	28.5	5.8	8.8	3.7	6.2	5.9%	
<i>M. diegensis</i>	119282	28.5	5.8	8.8	3.7	6.2	5.9%	
	2064	31.9	6.3	19.7	3.8	6.2	5.9%	

<i>M. milleri</i>	1080/2039	26.8	5.2	19.4	8.4	3.3	6.0%	5.5
	10750	26.2	5.1	19.4	8.4	3.4	6.0%	5.2
	2253	27.6	5.5	19.9	8.3	3.1	6.2%	5.0
	2484	25.6	5.4	21.0	7.9	3.1	5.9%	5.4
	2352	24.5	4.8	19.8	7.4	3.2	5.8%	5.5
<i>M. milleri</i>	2345	24.4	5.2	19.6	8.2	3.0	5.6%	5.3
Shallow depression into olecranon double ridge palmed below Cetylus								

two bones deep	1128	24.97	wt 26.6	18.77%	5.25	19.8	7.9	3.0	6.1%	4.9
		↑	(26.9 mm)							
deep	1128	24.97	wt 25.15	20.79%	5.7	22.3	8.2	3.3	6.2%	5.3
		↓	(25.6 mm)							

deep depression inside olecranon

shaped ridge below Cetylus in *cedrosensis* layout ridge present Cetylus. (not in 15424!)
 the int ridge is lacking or much reduced in *diegensis*, but the V is present in *milleri*
milleri also has the depression on the int side of the olecranon as in *cedrosensis*.

ML

Lr 4301

The ulnae that flare out slightly in ulnar profile at the olecranon are:

119279 depression with olecranon (olecranon inc.)

119280

119281

119283 (82 broken)
(84 ")

119288

119287 less notably flared.

Capromentatari Lr 4301

#119290 - size supports muller (8.7 depth prox ^{min. muller 8.8} ^{13.5} ^{slightly H.M.I.} (min muller 12.6 ^{max 14.5})

#119291 - inc but prox depth even so is more than muller (9.8 inc ^{min 8.8-9.5} ^{+10.2})
could be diagnosed as cedus. (calif. 11.8+) Too poorly preserved for detail of contour

Radius 119292

greater depth shaft 5.3

muller 4.6 - 5.6

cedus 5.4 - 6.1

dryus 6.3 - 6.4

Scapula 119264 h. 11.6

muller 10.3 - 11.8

Coacoids 4301

WING BONES

119255 - tip. Scapular end protrudes upwards
with ^{upper} contour concave; t cones to 9 mm ft.

Turns up more than in type of cedrosensis
Inner edge Scapular facet does not ^{appear to} overhang tricipital groove depth
but this area is eroded?

119259 - tip. Scapular facet is complete & does not
overhang tricipital area as markedly as
in cedrosensis. And, as in 119255, the
upper tip curves up more markedly
than in cedrosensis espec. as viewed
from above

119259	Br. lower edge facet	8.6 mm
	ht to tip of facet	6.7
	br tricipital space	9.3
119258	Br. lower edge facet	8.0
	ht to tip facet	6.0 (mic)
	br tricipital face	6.0

64147
44863M. chogensi
lower edge facet 8.3+
to tip (ht) 6.0
br tricip. 6.0
depth br sh below process 5.4 x 5.9

Loc 2422
9.1
5.0 mic
5.6
48. x 5.7
4.4 x 5.6

64147
Cedros type br. facet 7.5
ht to tip 5.3
br tricip 5.3
depth br sh below process 4.8 x 5.4

Cedros
65150
br. facet 7.3
ht facet to tip 5.9
tricip. space 6.0
depth br sh below process 4.8 x 5.7

Loc 4301 depth br. sh
119253 4.7/4.2
119254 5.6/5.7
119257 4.3/3.2
119254 4.4/3.2
119258 3.9/4.8

Scapulae 4301
left 119172 - 12.4 (br sh 5.8)
ht 119147 - 13.25 (br sh 6.0)
ht 119244 - mic but is at least 13.0 (br sh 5.7)
✓ left 119264 - 11.6 mulleri (10.3-11.8) ^{br sh 5.2} mulleri
left 119263 - mic but at least 12.0 (sh below 6.2)
ext 119261 - 12.3 (sh 6.0 below end)
✓ left 119265 - mic, may be mulleri (below 4.9)
to 119264 below is 5.2
✓ left 119262 - mic, may be mulleri (br sh 6.0)
to be 10 or less (5.0 below end)

at 119373 - 12.3 pr (5.3 br below end)
Type Cedros - 12.4 pr (6.3-6.4 ^{sh} below end)
Cedros loc 14410 - 14.1 pr (6.4 + br sh)
Cedros 65150 13.8 " (br sh - 6.3 +
with Cedros 1344 14.3 " (br sh - 3.2 may be ??
Camp Cedros 44860 13.5 " " 6.2

Tarsus $\frac{4301}{119298}$

Length 41.35
prox br 10.2
least sh br 5.0
ext depth sh 4.4

$\frac{4301}{119174}$ metatars 4301 mm has very strong midt. ext. leg

6.0
5.3

SEE leg Bone sheet

repeated on

diagnosis $\frac{1071}{2178}$
Length 43.5
prox br 17.0
least sh br 5.3
ext depth ext. 4.8

Cedrus $\frac{65144}{15425}$

37.3
10.0-
4.75
38

Cedrus $\frac{65132}{12402}$

8.9
4.5
4.1

Humerus $\frac{4301}{119372}$

Quote diag. cedrosensis p. 11 re "contour of shaft & bicip crest broadly & gradually curved & sillon head between pectoral attach. & pneumatic fossa oval deeply depressed."

4 to 119372 exactly. Humerus lent to plotogen for cedrosensis is 17.0 & ACU 119372 measure only 16.6 mm. The top of int. side broken & could add 4 mm.?

Other humeri from 4301

119222 prox br 18.9
119273 17.8
119269 18.5
119224 (lateral bicip crest) 17.5 (pneumatic fossa merged)

distals from 4301

119166 br 5.4 miller?
119272 br 5.8
119278 br 6.8
119275 br 6.5
119276 br 6.4
119167 br 6.8
119271 br 6.5
119168 br 2.8 broken ext. h
119407 br 6.9
119165 br 6.5 int. next condyle
119109 br 6.2 int.

Br dist end humeri

type cedrus 7.1
15367 7.0

(length 72.4) sh depth 11.0 (diagnosis sh depth 8.4-10.5)
(length 72.7) 11.5 (diagnosis br dist end 6.5-8.0) omith 2670 = 6.5-7.1
miller br dist end (5.3-6.2)
cedrus br dist end 7.0-7.1
cedrus depth sh 11.0-11.5 (just 2 meas.)
type 15367

4301 dist humerus br 5.5

119166 " " br 5.8
119272 " " br 5.8
miller 5.1-6.2
diagnosis 6.5-8.0 (7.1?)
cedrus 7.0-7.1 (only 2 meas'd)

milleri dist humeri

2510 - br 5.1
2046 - br 5.9
2326 - br 6.1
2219 - br 6.0
2850 - br 5.9
cedrus dist humeri
type - br 7.0 (7.1?)
15367 - br 7.0
15383 - br 7.2
diagnosis dist humeri
10428 - br 6.8
2695 - br 6.7
10750 - br 6.5
111 - br 6.5
2670 - br 8.0
UCMP 45856 - br 6.7
" 45856 - br 7.4
UCMP 45857 - br 6.9 worn

WING BONES

Wha

(Cedar
6.2-7.2)

Repeated on LEG BONES sheet

only 2
dist
2 track
7.3

Caracas

Cedar,	^{better} 5' 4"	^{better} 5' 0"	Crust the nearly to end
15' 4' 0"	5' 4"	5' 0"	35.3
15' 4' 10"	5' 4"	5' 0"	37.25
differ	5' 4"	4' 4"	38.9

4301
119253 5.7

ln 4301

Scapula - br prox end
prox shaft br dist

119261 - 12.3 ✓	5.7 ✓	2.8 ✓
✓ 119267 - 13.3 ✓	5.0 ✓	2.9 ✓
119289 - 11.6 ✓	5.3 ✓	2.3 ✓
119265 - 9.1 ✓	4.7 ✓	2.0 ✓
119263 - 12.1 ✓	6.4 ✓	2.9 ✓
119266 - 12.9 ✓	5.7 ✓	2.8 ✓
1030/174 13	5.4	2.7
1030/2047 12.3	5.7	2.2
1071/104647 10.5	5.2	2.5

Collected by ~~Brace~~ Bruce Welton & Fred

may 26
at dist humerus
at prox ulna } upper beds

Sacrum + part ^{at} pelvis (lower beds)

Add to list from Saukhateo

4 cedar scap. excludin type	sh br.	sh depth	3.0 at rap
15410 - m 13.5	6.3		
154107 - " 14.1	6.3		3.1
15419 - " "	7.1		2.7
15401 - m	5.7		2.7

ulna of cedrosensis type extend side - Tricipital attachment larger more posterior and blending up into space between olecranon and cotyla as compared with ror. diegensis in which the attachment is ^{at clear from cotyla} very clearly runned posteriorly separating it from the space between the olecranon & cotyla.

Assign to m. cf cedrosensis

Humeri prox left 119269, prox. rt. 119273

" " 119222
(mus. coll.)

Tentatively assigned to cedrosensis

vis. left 119105 length 69, 1 prox br. 12.2 dist br. 6.6

prox left (unc) 119268 prox br. 12.1 has depressed narrow trapezoid

left coacoid 88614 UCMF manilla ok for cedrosensis
size suggests cedros, 45.5?

Scapula left 11926-65 (4) manilla ok

(119264 size = median 71.6)

Coacoid part 119223 manilla sp

carpo 119291 bp part manilla sp

Get specimen #107028 for diegensis

Table III

To be checked 22 A
Copies

Measurements (in millimeters) of Oceanside Praemancalla
Bones Compared with Those of P. lagunensis, P. wetmorei
and Mancalla diegensis

	Oceanside axis 107028	P. wetmorei	P. lagunensis	M. diegensis maximum
③ Carpometacarpus				
Length	36.3	36.3(est.)	-----	37.2✓
Depth through M1	11.8	12.1.	11.7	11.0✓
Length process M1	15.2✓	15.7	14.0 - 16.0?	15.5
Breadth shaft	4.0	4.0	4.5	3.7
Breadth trochlea	5.2	5.3	5.2	
② Ulna 107028				
Length to intera cotylar ridge	36.7✓	-----	-----	32.0✓
Proximal breadth	7.5✓	7.5	-----	6.6
Proximal depth	11.0✓	11.3	-----	9.3
Breadth shaft (mid)	4.4	4.2	-----	3.9
Depth shaft (mid)	6.6	6.2	-----	6.8
① Humerus # 107029				
Length to intercon- dylar sulcus	81.0	81.0✓	-----	83.4✓
Proximal breadth	20.5	22.2✓	-----	20.3✓
Gr depth shaft	9.8	9.6✓	7.7	10.3
Breadth shaft (same place)	5.2	5.1✓	5.1	5.2
Scapula VEMP 95119				
Proximal breadth	13.8	12.7	12.5	14.4
Breadth shaft	7.3		6.2	
④ Tibiotarsus articular surface				
Length to prox- art articulation	105.1✓	-----	-----	98.5✓
Distal breadth	13.5✓	-----	-----	10.7✓
Distal depth	12.1	-----	-----	9.7
⑤ Tarsometatarsus				
Length	47.5✓	-----	-----	43.6✓
Proximal breadth	12.1✓	-----	-----	10.7✓
Distal breadth	11.6✓	-----	-----	9.4
Shaft breadth (mid)	6.1	-----	-----	5.4
Pedal phalanx				
Length	19.1	-----	-----	-----
Proximal breadth	5.7	-----	-----	-----
Distal breadth	3.4	-----	-----	-----
Thoracic vertebra #3				
Gr. Length	18.0✓	-----	-----	-----
Centrum length	11.9	-----	-----	10.0
Breadth centrum (ant.)	8.3	-----	-----	7.3*
Breadth centrum (post.)	4.3	-----	-----	6.5*
Axis vertebra				
Length centrum	12.2	-----	-----	9.4**
Dorsal breadth	7.1	-----	-----	6.2**
Breadth Centrum (post)	3.1	-----	-----	2.7**
Height centrum (post)	5.5	-----	-----	2.8**

ulna
embry 37.2

chub
radius fm
45121
embry 13.7
5.7 embryo
8.7 embryo

chub
tarsus fm
45121

*Measurements of thoracic vertebra refer to M. cedrosensis, not M. diegensis
** Measurements refer to only Mancalla axis vertebra of M. diegensis.

Add hum
diegensis

Papers related to archaeological geology, extracted from
the Bibliography of Hildegarde Howard

1929. The avifauna of Emeryville shellmound. Univ. Calif. Publ.
Zool. 32:301-394

1931. A new species of roadrunner from Quaternary cave deposits
in New Mexico. Condor 35:15-18 (With Alden H. Miller)

1933. Bird remains from cave deposits in New Mexico

Praemaucaella meas. Aug 15, 1976

	Praemaucaella lagunensis	P. metmori	P. sp. (Oceanside)	May Mammals
Carapace				
Length prox M1	14.0	15.75	15.0	17.1 15.5 14
Depth prox Hum M1	11.9	12.1	11.7	11.2 11.0 11.1
Br. prox hook	5.0 - 5.2	5.4	5.2	3.4 3.7 3.8
Br M. 2	4.7	4.2	4.1	
Depth M2	4.5	3.9	4.0	
Ulna		11.2	11.1 (broken olecranon)	9.9 8.3 10.7
Depth prox		7.5	7.7	6.5 6.6 7.2
Br. coracohumeral				

Possible distinction occurs from metmori
ext. side ulna adjacent to olecranon more defined
in Oceanside (seamed area with rim bordering it
anteriorly but wider no rim in metmori)

Coracoid			
Br. coracohumeral surface	6.4	6.3	6.3
Length of same	8.2	11.7	11.7
Br. below fore facet (with int side facies me)	4.85	4.2	5.0
Depth below facet	5.0	5.2	5.9

Possible distinction in coracoid: metmori narrower
and falcular facet more rectangular (more
deeply troughed beneath). Oceanside very
different from lagunensis (has int ridge like
metmori absent in lagun.).

Humeral length	?		
Br. prox	?		
Br. dist	?		
Tarsometatarsal			
Length			
Br. prox			
Br. dist			
Br. calcaneum			
Tibial length			
Br. dist			
Depth n			

M. diegas m. cedus m. calif
may may may

carb.
- 37.2 - 36.0 - 41.3
- 11.0 - 11.1 - 11.0-11.6
- 15.5 - 16.0 - 26mm 17.4
- 3.7 - 3.8 - 3.1-3.8
- 4.6 ^{mid?} _{BVCMP} - ? - 4.7 ^{36mm} 5.0
5517

where
- 32.0 - 31.7 -
- 6.6 - 7.2 - 6.5
- 9.3 - 10.0 - 10.7
- 3.9? - 4.2 - ?
- 6.8? - 6.6 - 6.7

here
83.4 80.0 -
20.3 20.1 - 19.4
- - -
- - 4.7 x 10.2

rib
- 98.5 - 83.9 - 87.3 feet
- 10.7 - 9.5 -
- 9.7 - 8.8 -
10.0

Two
- 43.6 - 42.0 - 39.3
- 10.7 - 10.9 - 9.9
- 9.4 - 9.3 - 9.3
- 5.4 - 5.6 - 4.8

34.1
348
1.3

Conee Veeep 20
to ref

Measurements (in millimeters) of Oceanside Bones
Compared with those of Praemancalla and Mancalla

	Oceanside	P. wetmorei	P. lagunensis	Mancalla diegensis
Carpometacarpus				
Length	36.3	36.3 est.	-----	35.0-37.2 (35.6 M)
Depth through metacarpal 1	11.8	12.1	11.7	9.7-11.0 (10.3 M)
Length process metacarpal 1	15.2	15.2	14.0	15.2-15.5 (15.4 M)
Breadth shaft	4.0	4.5	4.5	3.1-3.7 (3.4 M)
br. rounded ?	5.2	5.35	5.25	
Ulna				
Length to inter-cotyler ridge	36.7	---	---	28.0-32.0 (29.4 M)
Proximal breadth	7.5	7.5	---	5.9-6.6 (6.4 M)
Proximal depth	11.0	11.3	---	9.3
Breadth shaft (mid)	4.4	4.2	---	3.9
Depth shaft (mid)	6.6	6.2	---	6.8
Humerus				
Length to inter-condylar sulcus	81.0	81.0	---	83.4 max (76.5 M)
Proximal breadth	28.5	22.2	---	17.3-20.3 (18.7 M)
Breadth head only	8.3			
Br x depth shaft	5.2 x 9.8	5.1 x 9.6	5.1 x 7.7	5.2 x 10.3
Tibiotarsus				
Length to articulation	105.1			81.0-98.5 (90.2 M)
Breadth distal end	13.5			8.2-10.7 (9.0 M)
Depth distal end	12.1			8.1-9.7 max
Tarsometatarsus				
Length	47.5			38.0-43.6 (39.9 M)
Proximal breadth	12.1			8.7-10.7 (9.6 M)
Distal breadth	11.6			8.8 max.
Breadth shaft (mid)	6.1			M.56

Less incomplete left 62.8

#2820 10.75

Mancalla may Thracic 3 43.6 8.0 #2, 8.4 #3

10.4 mm. deep (a longer neck than 2 in unis also)

last dorsal 62

last 6.4

8.4 x 4.1

ant. centrum (mancalla dieg. 7.5 x 3.8)

pedal phal 19.1 5.7 3.4

1 dig 2

Scapula 13.8

400

12.4

12.5-14.4

20 M 13.5

640

Table of measurements (in millimeters)

June 1977

	10728	P. wetmorei	P. lapponicus	Pinguinis	M. chrysops max	M. cedroris max	cap
Carpometacarpus				45.8	37.2 (38.6)	36.8 (34.9)	11.3
Greater length	36.3 approx.	36.3?			11.0 (10.3)	10.2 M	11.0
Depth thru M1	11.8	12.9	11.9			15.6	4.8
Pr. to achla	5.2	5.4	5.2		15.5 (15.3)	16.0	12.7
Length per. M1	15.0 (15.2?)	15.3 (15.7?)	14.0				
Pr. shape	4.5	4.3	4.5		31.8 (30.9)		
Radius humerus		35.8					
Ulna				59.0	32.1 M	31.7 M	29.5
Length to infer- w. glenoid	36.7				6.6/6.4/5.9	7.2 M	6.5 type
Breadth per. stylar	7.5	7.5				6.4	6.2
Prox depth thru olecranon	11.0	11.3					
Breadth & depth middle shaft	4.4 x 6.6	4.2 x 6.2			9.3 ones, mean	type 6.2 x 4.2	6.5-6.2-6.2 depth
Depth external side distal tuberosity	8.1				5.0-7.4	6.8 x 3.9 (2064)	3.8, 3.9, 4.2 br.
Surface tub. to ext. condyle (diagonal)	8.8				8.3 (2064)	8.3	7.3 max
Radius to dist. olecr.	18.0/20				max 8.6		ceder type 8.35
Humerus				102.2	M. 76.5	M. 73.5	
Length to infer condylar surface	81.0	81.0			83.4 (2064)	an. 80.0	but what to radius?
Prox breadth	20.5	20.9	20.0		same as hum.	M. 47	M. 17.9
(Humerus) bicipital contour	15.5	19.6			20.2 (2064)	20.1	19.4?
Breadth acromion	5.2 x 9.8	5.1 x 9.4	5.1 x 7.7				
at gr. depth	53.0/20	33.0/20	44.2/20				
Coracoid							
Length coraco- humeral surface	10.0	11.0	8.2				
Breadth same	6.3	5.9	5.5				
Pr. olecr. foveolar facet	5.6	5.8	6.0		6.3	6.0	5.9
Prox to top of glenoid facet	10.4	10.4	8.4				

remeasure to this exact dimension - the Maucall diaphysis
humerus & coracoid bones

	10228	P wet	P dry	miller	m. dequar	m. cedar	m. calit
Tribesman					m. 90.2	Pinus 134.0	83.9
Length	105.1	—	—	—	98.5	9.5	82.5
Bridle	13.5	—	—	—	10.7	9.5	—
Depth	12.1	—	—	—	9.7	8.6	8.1
B. ph. ph. ph.	9.5	—	—	—	8.8	?	—
Depth sh. 11					6.9 x 4.1		
B. x depth sh.	7.9 x 4.9				43.6	42.0	38.3
Tarsometatarsus					10.7	10.9	9.9
Length	47.5	—	—	—	8.8	9.3	9.3
Width	12.1	—	—	—	4.2 - 5.1 (4.7m)		4.8
Depth	11.6	—	—	—			
? to mid sh	6.1	—	—	—			
Length from					40.5		39.3
mid sh to							
end of							
to							

Ratio to

Other sp.

Ratio carp

ulna

humer

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Ratio to

Other sp.

Ratio carp

ulna

humer

to

to

July 29, 1977

Table of measurements

USF means
(San Mateo) vs. S. Diego
107028 *Phaenocarpa* *manacalla*

	107028	M. calif.	Cedro.	diegoense	Type Int. P. uncinata	P. lag.
Ulna						
Length to cotylae highest pt on cotylae/ (across cotylae)	36.6 / (34.3)	—	31.7 - 28.3 29.9 type	32.1 - 28.0 29.4	36.3 est.	
Depth prox	10.8	9.9? 10.7 est.	10.0 - 9.5 type 9.5	6.4	11.3	
Br. prox	7.6	6.5	7.2 - 6.2 6.6 (type 6.5)	6.6 - 5.9	7.8	
Br. shaft mid	4.5	—	4.2 - 4.0 type 4.2	—	—	
Depth " "	7.0	6.7	6.6 - 6.3 type 6.2	—	—	
Depth dist end	8.0	—	7.8 - 7.0	—	—	
g. dist. dist end (through carpal tub.)	8.7	—	8.8 - 8.1	—	—	
Radius	—	—	radius of Cedro. 29.0 type	—	radius of ununcinata 35.8 1976 new	—

Carpometacarpus						
g. length	36.3	—	36.0 - 34.9 35.4 (type 34.8)	37.2 - 35.0 36.6	—	—
Length prox. M1	18.1	17.7 - 16.8	16.0 - 15.4 16.5	15.5 - 15.2 15.3	15.7	14.0
Depth prox	11.7	11.6 - 10.9 11.2	11.1 - 10.2 10.5	11.0 - 9.7 10.3	12.8	11.9
Br. trochlea	5.3	5.1 - 4.7	—	—	5.4	—
Ratio M1 dist	41.2%	—	44.0%	43.2%	—	—

Tibiotarsus						
Length	105.5	87.5	89.9 type	98.5 - 81.0 91.2	—	—
Prox br.	11.6 mm	8.6	—	—	—	—
Leant br. sh	7.5	6.1	9.4 9.2	9.0	—	—
Br. dist.	13.5	—	9.7 - 9.0	10.7 - 8.2	—	—
Depth dist.	12.1	—	type 8.8	—	—	—

Tarsometatarsus						
g. length	47.5	?	39.2 42.0 - 37.3	39.9 43.6 - 38.0	—	—
length dist. dist.	47.1	—	—	—	—	—
Prox br.	12.0	9.9	10.9 - 9.9 10.3 M	10.7 - 8.7 9.6	—	—
Dist br.	11.7	9.3	—	10.7 - 8.7 10.3 M	—	—
Dist br. 2+3	8.25	?	—	—	—	—
Leant br. sh	6.1	4.8	—	4.7 4.2 - 3.1	—	—

more	VCMP	m. cond.	cedrus	type	degreise	P. wet.	P. dry.
<u>Scapula</u>	107030	—	14.2 13.7 12.6	13.5 M	—	12.5	
prox br.	13.8	—	14.2 12.6	14.4 - 12.5	—	6.2	
cr sh	7.3	—	2.4	6.9	—		

Humerus	107029		type 72.4	96.5	(82.7 mm)
leg th	80.8	distal only	80.0/73.5/69.8	85.2 - 71.0	81.1
condyles			type 12.9	83.4 (condyles)	
prox br.	20.9	—	20.1/17.9/17.0	20.3 - 17.3	
				18.7	

✓ femur	VCMP	64 ap	56.5/55.4/54.7	57.0/55.2/53.8
Distal			type	
R. shaft mid				
Distal sh mid				

Californiacanthus		2578 Calif 1967	2033 Calif 1967	2583 Calif 1966	Mission Viejo La 3891	and same	UCMP 47861	5.1240 2345
a	length pro. m1	17.7	17.4	16.8	11.4	10.1	10.35	9.1
b	depth pro. end	10.9	11.6	11.3	5.1	4.5	4.6	3.8
c	Bl. tubula	4.7	5.0	5.1	47.9	46.0	67.8	68.1
	Ratio ba	61.6	62.6	62.2	30.2	29.4	30.2	26.4
	Ratio ca	26.5	28.7	30.2	44.4	44.5	44.5	41.8
	Ratio cb	43.1	43.1	45.1				

OMIT Over in ket

Pedal phalans 88640 from loc.

✓ cm P ✓ 68144, 88646 from loc

✓ 68144 (frag. of left scapula no prox
end)

June 18 - To do

- ① Compare size of Coracoid 119260 to Cattle Columba & get range in size for comparison with humerus already measured (C. albino)
- ② Pedal phalanx Sulidae 119312 check Mous & Sula & get size, Phal #?, digit #?
- ③ Pedal phalanx eagle 119310 look at Aquila & Hal, size comparison?
- ④ Tibia #?
get collection dates for these

level in SD bones. coll.
Complete studs of Jeune loaded by 50 mos
from occasional lower level

- 5) check other index bones in UCMP
coll. ~~16862~~ or with ? 68144
= 4298 scale & pedal phalanges
See p 24b

4301

Aves indet

8mt

one dist end of left tibia removed 121532

Truncallia mulleri + Sal 9

Calcipontia left 119290 (length 13.7, depth 8.8)

Radii 119292 (sh depth 5.1)

left ulna 119283 (length 27.2, max b. 5.5) 119286 (h. 5.2)

check
distraction
for dist br.

Humeri 119166 (dist b. 5.6 - paraclyps 5.1) 119272? (h. 5.7 del)

Scapula 119289 (h. 11.5)

left 119243 (h. 11.5)

left 119242 (h. 11.5)

~~this left dist 119291~~

mulleri 9

cedrorum 12

deguis 2

23

sp? 54

77

23
57
80

Pethia roosemuri ref. humerus 18949 Loc. 1945 badly eroded

br. dist end ^{4.6 to lig. attach.} 4.3 $1.8 \times 2.6 =$ br to depth shaft

br condyles 2.7

4.5 = lit ectepicondylar proc. from dist end

✓ Humerus from San Mateo LACM loc 4297 specimen # 107034

5.0 to lig. attach

br dist end 4.6

2.0 x 2.7 br to depth shaft

br condyles 4.0

4.9 = lit ectepicondylar process from dist end

Pethia sp. # 37686 Loc LACM 6906

br dist. end ? 5.3 to lig. attach.

2.3 x 3.4 br to depth shaft

br condyles ? 4.9 ? int condyle mesium 5.2 lit ectepicondylar proc. from dist end

axis vertebra

Mauacalla UCM 45892 San Diego

Loc UCM 68145
102428 from Occidente

Uria	Length centrum	9.4	→	12.2
7.6	least dorsal br.	6.2	→	7.1
5.7	gy. br	13.3	→	18.9?
12.8	br. ^{at} post centrum	2.7 x 4.4	→	3.1 x 5.5
1.7 x 2.8?				

Uria's vert. # 102428 resembles Mauacalla from San Diego
as compared with *Uria a. caly.* facets of post zygapophyses
are more round than oval, but more concave than in Mauacalla.
aut. part sides more deeply depressed ^{for aut. end} than Mauacalla suggestive of
condition in *Uria*

Scapula UCM 95119 from UCM 68145

prox br. 13.7

same meas in *P. lagimera* 12.5

sh 3.3 x 7.3 (br x depth)

2.7 x 6.3

length facet 5.9 depth facet 4.7

5.35 length depth 4.9

length off-center 5.8

4.6 inc.?

TO DO check Mauacalla *dygense* from San Diego
LACM 2345 scapula (large)

are the measurements 14.4 br prox

7.7 br sh

3.6 depth shaft ?

check flatness of shaft +

shape of glenoid + coracoid attach.

in 2345 compared to UCM 95119 Occidente

Miller's scap 2345 is broader but more concave
and glenoid very prominent
glenoid eroded in UCM 95119

10728 M. ced. M. diegense 1. calif.
 Carpus 36.3 36.0 37.2 41.1
 Ulna 36.6 36.7 32.4 7.

First Notes

Praemancalla cf wetmorei

from Barnes
 Loc 1253
 Lawrence Canyon

Referred material.-- Associated elements: incomplete carpometacarpus, ~~metacarpus~~ ulna, tibiotalus, tarsometatarsus LACM no. 10728; poorly preserved upper end of coracoid (LACM no. 107030); (?) proximal end poorly preserved scapula UICMP no. 95119; nearly complete humerus LACM no. 10729.

Lawrence Canyon
 10729

Loc 1253
 Lawrence Canyon

Barnes Loc 1260
 Lawrence Canyon

Description.-- The following characters place these specimens with Praemancalla as distinguished from Mancalla: Carpometacarpus with clearly developed pisiform process, ulna with olecranon blunt, but protruding proximally beyond cotylae, Coracoid with coracohumeral surface broad and flat, not twisted posteriorly as in Mancalla, humerus ~~with~~ lack of papilla above internal condyle, deltoid crest not prominently developed, wide curve between head and bicipital surface ("capital groove wide open").

facial
 distal-lateral

pr
 humerus

The humerus resembles P. wetmorei rather than P. lagunensis in 1. Greater protuberance of the ectepicondylar process from the shaft; 2. More external placement of ectepicondylar process; 3. Groove between process and shaft more constricted; 4. shaft breadth 54% of depth (br. 5.2, depth 9.8 in humerus 10729; 5.1 x 7.7 = 66% in p. lagunensis) The humerus is incomplete distally-- length to intercondylar sulcus is 80.8 mm, same dimension in P. wetmorei 81.1 mm, maximum Mancalla (M. diegense) 83.4 mm. P. lagunensis is incomplete (dist. only) Prox. breadth of humerus 20.9 mm (greatest breadth in M. diegense 20.3mm) Distance from head to deltoid 17.6 mm (M. diegense max. 17.3 mm).

sherman
 method
 2018

The ulna of LACM 10728 is distinguished from Mancalla by the prominent olecranon process. It resembles the paratype ulna of P. wetmorei in the position of the brachial impression which is partially palmar, in position and bordered palmar by a heavy ridge. The distal end was not present on the paratype of P. wetmorei. Compared to Mancalla, LACM 10728 is more rugose distally with more definitely delineated condyles.

Length to intercotylar area 36.6 mm (Max. Mancalla (diegense) 32 mm)
 Breadth across cotylae 7.45 mm (cedrosensis 7.2 and diegense 6.6
 P. wetmorei 7.5
 Depth proximal end 11.1 (P. wetmorei 11.3, M. cedrosensis 10.2,
 M. diegense 9.3)
 Breadth x depth at middle of shaft 4.4 x 6.6 (P. wetmorei 4.2x6.2
 Depth distal end externally 8.1, Breadth across condyles 5.5,
 Greatest breadth distal end 8.6 (M. diegense 2064 max.)

The carpometacarpus resembles P. wetmorei rather than P. lagunensis in having a longer process of M1, actually as well as relative to depth of proximal end through M1, and in the narrow shaft of Ma. Also, the lateral surface of the internal trochlea is less deeply depressed than in P. lagunensis.

Breadth of shaft 4.0 (P. wetmorei 4.3, P. lagunensis 4.0-4.7
 Breadth proximal trochlea 5.2 (M. wetmorei 5.4, P. lagunensis 5.2)
 Length process M1 to its attachment 15.0 (P. wetmorei 15.3, ~~xxxxx~~
 P. lagunensis 14.2, Mancalla cedrosensis 16.0, M. diegense 15.4)
 M. calif. 16.6-17.7)
 Length carpometacarpus 36.3 (cedros. 36.0, dieg. 37.2, calif. 41.1)
 Depth proximal end 11.8, M. dieg. 11, calif. 11.2, P. wetmorei 11.9,
 M. cedros. 11.1 P. lagunensis 12.1,

Mygale 140

Depth shaft 3.6(?) (4.1 lagunensis, 3.9 wetmorei)

Measurements of coracohueral surface

P. lagūnensis	"	8.2	"	5.5
---------------	---	-----	---	-----

P. wetmorei	"	11.0	"	5.9
-------------	---	------	---	-----

No scapula was found with the Laguna Niguel material

M. diegensis (Miller 2345 14.3 complete. All Mancalla scapulae

San Mateo specimen is eroded so it is not clear whether it

Mateo specimen, the acromion and glenoid facet are less

prominent than in Mancalla -- however, these contour are

incomplete in lagunensis just as they are in San Mateo speci.

Breadth *P. lagunensis* 12.5 mm

The coracoid has the tub. ~~cor.~~ ^{sc.} facies more medial than in man. ¹ ~~ac.~~ ^{sc.} ~~but owing to the position of the specimen~~

Seymouria *corax* *affinis* 8.9, 8.59 - P. *lag.* 9.3 - 5.5 / *P. met* 11.6 x 5.5

Depth ^{km} ≈ 7.7

Depth - 5' 3 1/2"

Tibia sh. br. x depth mid 7; 1 x 4.6 (6.4 x 4.3 M. diegensis UCMP 46015), 7.3 x 5.7 Pinguinis
Tibia sh. br. x depth dist

The tibiotarsus and tarsometatarsus associated with the ulna and carpometacarpus of LACM 10728 are larger than in Mancalla

Length to articulation 105.1 mm (M. diegensis UCMP 46015 98.5,

M. cedrosensis 83.5, M. californiensis 87.5 est.) Pinguinis 119.4

Breadth distal end 13.33 (Max. diegensis UCMP 46015, 10.7, Pinguinis 12.7

M. cedrosensis 9.53 (no dist. end for calif.)

Depth distal end 12.1 (Max. diegensis UCMP 46015, 9.7 Pinguinis 12.5

Post. br. dist. end 11.3, Max. diegensis 8.5 UCMP 46015)

Length tarsus 47.5 (Max. diegensis 43.6, cedros. 42. Pinguinis 50.5)

Prox. breadth 12.1 (max. diegensis 10.7, cedros. 10.9 " 13.1

Dist. breadth 11.65 (diegensis 8.8, calif. 9.0, cedros 9.3 Ping. 13.1)

Qualitative characters of tibiotarsus: anterior face of shaft below proximal end flatter than in Mancalla, with a broad, shallow longitudinal depression adjacent to the fibular crest. In Mancalla the shaft is convex with a conspicuous longitudinal ridge. The distal end has a greater flare than in Mancalla, breadth relative to length 12.6 % (9.9-10.8% M. diegensis, 11.2% cedrosensis, 10.2 % milleri)

Qualitative characters of tarsometatarsus 107028: Like the tibia, the tarsus is markedly larger than any recorded specimen of Mancalla. It is distinguished from Mancalla anteriorly by the more proximal position of the distal foramen, set in a shallower groove. The central portion of the anterior surface immediately above the middle trochles is broader and flatter (distal end more broadly, and evenly rounded) The shaft above the middle is less acutely raised than in Mancalla with less depression adjacent externally (anter. face). Trochlea 1 is less raised above the dist end.

The bridge is not ossified across in the tibia. This is true, as well of M. diegensis, but not of M. milleri

Tarsometatarsus cont'd, ext. border of the shaft anteriorly is raised but presents a less acute ridge than in Mancalla. The more clearly ridged than in Pinguinis. The internal border is not raised rounded

Both external & internal border of shaft anteriorly are less acutely ridged than in Mancalla - the int. border being rounded & lacking any raised portion (even less raised than in M. diegensis)

Distally, the anterior face of the shaft immediately above the middle trochlea is less acutely raised than in Mancalla, in this respect resembling Pinguinis. The int. trochlea, however, rises posterior more abruptly than in Pinguinis & presents a flatter int. surface, longer prox-dist than ant-post. The trochlea is higher than deep (the opposite is true of Pinguinis which has greater protrusion posteriorly into a knob, Praemancalla rounded post'ly).

1194 | 1270
 1194
 268

Note: Tibia of Pinguic has more rounded shaft even than Mancalla. Has no ridge below cnemial crest - just smoothly rounded.

Tibia	dist. ext condyl.	dist. int condyl.	Br. dist (ant)	dist. br. approx aa
San Mateo	88.9 - 12.0	12.1	13.9	The area is cracked possibly 5mm narrower
94.7	8.7	8.6	9.8	92.5 20
104.1	9.5	9.7	9.1	106.5
92.1	8.9	9.0	9.7	92.4 21
96.8	9.2	8.9	9.5	92.5 20
98.6	7.3	7.2	7.4	92.6 20
93.4	7.9	9.13	10.6	86 20
99.3	12.6	12.3	12.7	97.2
San Mateo	23.5	105.0	12.4 - 12.8 20	
UCMP 46015	22.8	98.0	10.8	
Cedar type	18.45	83.7	10.0	
M. celis	19.2	?		
M. diep 2308	19.6	92.3	21.2	9.8 7
" 2477	19.6	91.8	21.4	10.3 5
M. muller 2053	15.3	74.4	20.9	

No ossified bridge in M. diep, M. cedar, otherwise none in P. wet, new tibia

Tarsometatarsus less columnar than in Mancalla, shaft flaring in this respect more like Pinguic. proximally - distally from hammet ext. edge of shaft raised but than in Mancalla but more so than Pinguic. slightly below mid point of length of element Tarsometatarsus less columnar than in Mancalla, shaft flaring gradually both proximally & distally from maximum point slightly below distal to midpoint.

048
 786
 068
 398
 080
 13.1131
 176

02
 825
 030
 88188

042
 356
 038
 064
 0151811
 43

The coracoid ~~is~~ resembles this element of Praemancalla as distinguished from Mancalla by the position of the triosseal canal facing more internally, less posteriorly and the coracohumeral attachment broader and flat and not ~~the twisted anteriorly~~. The distinguishing characters of *P. wetmorei* vs *lagunensis* are not clearly delineated. The distal end ~~xxxxxxxxxxxxxxxx~~ of the Carpometacarpus and ulna which was lacking in previous specimens of Praemancalla, is present in the LACM specimens from Lawrence Canyon. The following characters of these elements can therefore be now be described:

2

Carpometacarpus, length 36.3 mm. Distal surface of metacarpal

Ulna, length to intercotylar area 36.6 mm, Distal end more rugose than in ulnae of Mancalla, carpal tuberosity prominent, tendinal groove (externally) deep with distinct projection overhanging the groove.

In view of the close resemblance of the carpometacarpus, ulna & humerus to previously described specimens of Praemancalla wetmorei and considering the fact that the fibiotarsus & tarsometatarsus were ~~also~~ associated with the carpometacarpus & ulna, ~~it is reasonable to conclude that these leg bones~~ ^{also} represent *P. wetmorei*. The foot presumed coracoid, scapula and furca can ^{be} only so assigned.

The addition of the fibiotarsus & tarsometatarsus to the ~~revised~~ elements represents *P. wetmorei* ~~providing~~ a ~~concept of this~~ ^{as to the length of the ulna & carpometacarpus, provides} as ~~concept of this species as compared to the~~ ^{better known} ~~Mancalla~~ ^{skulls & mandibles} ~~than~~ ^{that} ~~is a suggestion~~.

Adding the information now gleaned from the leg bones ~~plus the~~ ^{as well as the complete carpus & ulna,} ~~provides~~ ^{provides} a concept of *P. wetmorei* as a bird with

Humerus.-- Although humerus LACM 107029 resembles the holotype of *P. wetmorei* as distinguished from the holotype of *P. lagunensis* in the distal characters described (Howard, 1976), it is slightly smaller than the holotype of *P. wetmorei* both in length and in breadth of proximal end:

Length to intercondylar area (condyles are incomplete) 80.8mm
(same dimension in *P. wetmorei* 81.1 mm), breadth proximal end 20.9mm
(*P. wetmorei*, 22.2 mm)

(externally) deep with distinct projection overhanging the bone.
Distal end of humerus, slightly flattened, slightly broader than proximal end.
Length to intercondylar area 80.8 mm, distal end more rounded than any of the species of *Meleagris* so far recorded.
Meleagris was a bird of much greater length actually, being 1.3 m. long, and the same individual, which that with the two wing bones assigned to *Meleagris*, it is the third element of the humerus, found associated with the humerus of *Meleagris*.
The humerus of *Meleagris* is 1.3 m. long, and the same individual, which that with the two wing bones assigned to *Meleagris*, it is the third element of the humerus, found associated with the humerus of *Meleagris*.
The humerus of *Meleagris* is 1.3 m. long, and the same individual, which that with the two wing bones assigned to *Meleagris*, it is the third element of the humerus, found associated with the humerus of *Meleagris*.

Measurements: Tibiotarsus, length 105.5 mm (Mancalla diegense,
^{Cedrosensis 83.9}
 maximum 98.5 mm): breadth of distal end 13.5 mm (M. diegense maximum
^{Cedrosensis 9.5 max}
 10.6 mm).

Tarsometatarsus: length 47.5 mm (M. diegense maximum ^{cedros. 42.0} 43.5 mm);
 proximal breadth 12.1 mm (M. diegense maximum 10.7 mm. M. cedrosensis
 10.19 mm); distal breadth 11.65 mm (M. diegense maximum 8.8 mm, M.
cedrosensis 9.3 mm).

DISCUSSION

Add short descriptions of wing bones which add to what was
 previously known (length of carpometa; and ulna, chars of distal end
 of ulna). Refer to poor preservation of humerus and coracoid thus
 providing no information.

Tarsometatarsus. — similar to Mancalla in general
 shape with ant surface depressed, bordered ext by ridge (more
 pronounced ridge than in Pinguinus (more depressed ant than
 Voria

DISCUSSION

... (6) ...
 in ...

... Say midline when

Stomach
 hadolene

dist	Ulna least depth	6.3	4.4	dist end	depth	7.9	[hadolene 10.3]
max	gr.	8.0	5.4	"	gr.	5.15	trichia only [hadolene 6.3]
mid	mid	6.9	5.0	gr. dist	6.8	drag thru carpal	hadolene 13.7
37.2 length	36.6			pro depth	11.0		
2.9	max depth	7.5	(same in ant view)	signature	11.3		

Excavations by the Natural History Museum of Los Angeles
~~County~~ (LACM) in 1975

was collected in the San Mateo Formation (Late Miocene) of Lawrence Canyon, near Oceanside, San Diego County, California. Included are two *Proconodont* specimens. The associated with element number 107030 is *Proconodont* *webbii*.

DESCRIPTION

The specimen collected at the Lawrence Canyon site includes a carapace, a single, slightly curved and somewhat flattened and pedicel phalanx found associated at locality Barnes 1823. Cataloged LACM 107030. A nearly complete, though badly eroded humerus (LACM no. 107030) was taken across the roadcut from locality Barnes 1823 at locality Hammer 286. Also from this locality (but called Barnes 1820) is a fragment of the upper end of a coracoid.

10.23.77

Coracoid. — The coracoid is so poorly preserved that ~~little~~ is ~~can be said as to its~~ difficult to compare it with the referred specimens of *Proconodont* *webbii* & *P. laguncularis*.

From facet to top of glenoid
 10.4 #107030
 8.4 in. long
 10.4 in. wide

The broad span bet. the humeral facet & the area of the procoracoid resemble *P. webbii*. Also the ^{long} ridge below the humeral facet is slightly inset from the dorsal face as in *webbii*. However the ridge itself is more rounded, less acute than in *P. webbii*.

In 1975, Additional material assignable to *Praemancalla* was collected ~~xxxxxx~~ by the Natural History Museum of Los Angeles County (LACM) in the San Mateo Formation (Late Miocene-Early Pliocene) of Lawrence Canyon, near Oceanside, San Diego County, California. Included are two leg bones. The associated wing elements suggest that the species represented is *Praemancalla wetmorei*.

~~XXXXXXX~~
MAJOR L
DESCRIPTION

The specimens collected at the Lawrence canyon site include: a carpometacarpus, ulna, tibiotarsus and tarsometatarsus vertebra and pedal phalanx found associated at locality Barnes 1253, cataloged LACM ~~1022~~x 10728. A nearly complete, though badly abraded humerus (LACM no. 10729) was taken across the roadcut from Loc. Barnes 1253 at Locality Hammer 226. Also from this locality (but called Barnes 1260) is a fragment of the upper end of a coracoid LACM 10730.

~~The following characters~~

Comparison of wing elements
~~As seen from the accompanying sketch at the wing elements.~~
The wing elements are assigned to *Praemancalla* on the basis of the following characters which distinguish them from ^{the} corresponding elements of *Praemancalla*

<i>Praemancalla</i>	<i>Mancalla</i>
Carpometacarpus with ^{dehydrated} proximal process	No noticeable prox. process
ulna ^{distinct} olecranon process prox. beyond cotyla	olecranon short
Coracoid: trochlear canal faint more medial than posterior	trochlear canal facing ^{more} poster. than medially
humerus: deltoid crest fainter a longer one	crest not ^{more} expanded toward prox. distal termination
no papilla distally above int. condyle	prominent papilla ^{not} above int. condyle

6.23.77

Tentatively referred. — ^{incomplete} ^{UCMP} ~~Terre~~ 95118, from UCMP loc. V 65145
~~on Lotta St. in Lawrence Canyon~~; ^{and} ~~incomplete~~ ^{scapula} UCMP
 95119 from "Lotta St. loc. 2", UCMP loc. V 68145.

Terre. — Although the specimen ~~lacks the features~~ ^{is broken both proximally}
~~crabrous and r distally~~, its estimated length relative to
 the mean for *Mauacalla diegensis* is 116% as noted, also
 for the *Tribolium* *Laem* 107028. The specimen has the
 slender, ~~robust~~ shaft with strong medial bend found in
 the ^{type} form of *M. diegensis* (UCMP 33409) a cast of which
 is at hand. It differs from all ^{the form in} ~~specimens of~~ *Mauacalla*
 in ~~greater distal~~ ^{flatter} depressed area above ext. condyle
 protruding, but ^{length} ~~flatter~~ ^{greater} flatter anteriorly. The ~~intact~~

6.23.77

Scapula. — The ~~ventral~~ ^{is} surface ~~is~~ ^{is} flatter, less
 depressed ~~surface~~ than in *Mauacalla*, ~~resembling~~ *Prac*
~~lag. in this respect~~. The scap (or P. med.) is not known.
 Compared to *Mauacalla* the glenoid facet is

~~less projected~~
^{high P. base}
 The ventral surface lacks the depression adjacent to
 the acromion found in *Mauacalla* and the glenoid facet is
 less projected. ~~However, the~~ ^{acromion is longer,}
~~than the~~ ⁱⁿ *Mauacalla* ~~lacks~~ the small ridge
 medially the acromion is lacking. As neither this spec. nor the
 scap assigned to P. lag. is well preserved, the two cannot
 be compared in detail.

Prox br.	13.8	lag.	12.5	M. dieg.	14.7	(M. 13.5)
to st.	7.8		6.2		6.2	

Humus 107029 from Hammer Co 224 (1975) resembles
Pracmaucella in distinction from Maucella in the lack of
flange of the distal end & absence of a papilla above the external
condyle. Proximally a broad depression runs from below the head
diagonally to the distal end of the shaft well below the beak area.
The same also of P. mitchellii. Partly the area of the ant. sub. is broken
so that the chaus which distinguishes M + P are not clearly
marked.

are used area dist. to the median crest in front
of Maucella. This depression is interrupted by a small
depression deep from the base of the median crest toward
the external of the shaft.

Humus UCMF 95118 loc. UCMF V-68145, ~~from~~ Prox end
missing, distal end poorly preserved. ^{long, slender} Shaft with strong medial bend
as in disjunct. Distinguishes from Maucella ^{distal} and similar to
M. milleri, & P. mitchellii in deep popliteal area. Distally
bent flange ~~per se~~ externally. I area above condyle is
depressed ~~as in~~ Chondyle.

Area above ext condyle depressed that flange ~~toward~~ anteriorly
Tubercular ridge broken ^{but} ~~so that~~ ^{superficial} of an anterior
flange

The carphonetacanthus clearly represents *Pracmauralla* as distinguished from *mauralla* by the presence of a distinct, blunt pisi form process

	to attachment	San Mateo	Wetmore	Plant	Cedar	Quercus	Calif
P. lag. met	Length of P. lag. M1	15.1	15.4	14.2	16.0	15.4	16.6-17.7
14.2	→ Br of shaft	4.0	4.3	4.0-4.7			
4.0-4.7	→ Br to cheek	5.1	5.4	5.2			
5.2	→ Length	36.3	36.0	36.0	37.2		41.1
11.9	Prox depth	11.7	11.1	11.0	11.2		

	lagunensis	Wetmore	San Mateo	Distance from top lag.	met	mate
Gr. length	37.2	36.0	36.3	Distance from top lag.	6.9	7.1
Length M12	13.7	15.3	15.0	Distance from top lag.	7.3	7.1
to attachment		5.4	5.2	Distance from top lag.	10.7	11.4
Br. to ch	5.15			Distance from top lag.	4.2	4.2
Depth thru M12	11.7 (84% of M1)	11.9 (77% of M1)	11.8 (81% of M1)	Distance from top lag.	9.0	10.7
Br. shaft	4.5	4.3	4.3	Distance from top lag.	17.4	19.2
Depth shaft	4.1	3.9	3.6	Distance from top lag.	19.5	19.2
Gr. length M1	14.0	15.5	15.1			
Depth prox	11.9	11.0	11.1			

The ulna also is distinguished from *mauralla* by the more prominent olecranon set off from the cotylar & undoubtedly protruding prox to the cotylar, altho the tip is broken.

In palmar aspect the brachial impression is even more palmar in position than in the paratype ulna of *P. wetmorei*. As in *P. wetmorei*, the brachial impression is short & partially palmar in position bordered palmar by a heavy

	P. wet.
Length	36.9 mm
Br cotylar	7.75
prox depth	11.1 mm
Br sh	4.6
depth sh	6.8

The scapula from UCM P (# V68145) is too poorly preserved
95119

to assign to genus

126 P. lag. inc. Pro br. inc. 13.9 ~~13.9~~ suggests equal to 15410 from Cedros 14.1 complete
from 15294 L Miller # 2345 from San Diego 14.3 complete

all San Diego scapulae have prominent glenoid facet
projecting beyond shaft. The San Mateo specimen is eroded so
it is unrecognizable & tell, as is, it is less prominent

Coracoid from br. 107030 has a broad ^{flat} coracohumeral surface
but does not narrow as abruptly as P. wetmorei. Anomali it
is longer & narrower than P. lag. In Maucalla the surface

	length	breadth	coracohumeral	to coracohumeral surface br. below facet	distance br. below facet
San Mateo	10.0	X 6.3		5.6	4.9
P. lag.	8.2	X 5.5		5.7	5.1
P. wet	11.0	X 5.9		5.9	4.2

ridge below facet broader & less. Canal is more rounded than in
wetmorei, more like lag. Trios. canal faces partly int'ly as in lag,
Maucalla more part'ly. Coracohum. surface flatter, less ^{anterior} ~~downward~~
twisted than lag & much less twisted than Maucalla

Coracoid ^{UCMP} 88619 from San Mateo fore 46.2 mm length
^{V68106}
from sternal ¹ tip & abraded head same as in Cedrosensis complete
The shape is that of Maucalla rather than Pramaucalla - the
triosteal canal faces more posteriorly than int'ly

Red Portiac Trieboid
521 NJA

Sauvage & Im - Oceanic -

Maucaallina

Praemaucalla wetmorei Howard

Referred material. — associated elements?
of coracoid, ulna, ~~scapula~~, ^{carpometacarpus}, tibia, tarsus, tarsometatarsus;
separate nearly complete humerus; scapula VCM P 95119
measured a few pieces

Description — The ^{carpometacarpus} immediately places
the specimen in *Praemaucalla* as distinguished from
Maucaalla.

The following characters place this material with
Praemaucalla as distinguished from *Maucaalla*.

Humerus

carpometacarpus with clearly developed pisiform process
ulna with olecranon blunt but probably prox. beyond coracoid
Coracoid - coracohumeral surface convex, with br. then in lapineum
scapula

These elements all resemble those of *P. lapineum* rather than *P. capensis*.

The tarsus & tibia had not been previously identified for *Praemaucalla*. These elements here associated with the wing bones are notably larger than any of the ^{maucallina} ~~maucallina~~ leg bones heretofore recorded.

Sauvage & Im

Humeral length 20.9 20.7 - 20.3 ± 2670
to head 15.5 14.0 - 15.1 ± 2670
breadth of head 17.6 16.5 17.3 ± 2670
depth of head 8.8 8.2 8.3 ± 2670

Associated Maucallinae Bones from San Mateo from loc. 107028

Right Tibia, comp. to artic.
 Left Tarsus, complete
 Ulna left, comp. except tip of olecranon
 Pedal phalanx, vert.
 Carpometacarpals left, length complete, M. 3 broken distally
 length M1 complete

~~Loc 107029~~ - Humerus, right, dist. end eroded
 length can be meas. to intercondylar space.
 Int. tub. lacking
 Loc 107030
 Coracoid, left
 frag of head and

From UCMF loc. V 68106 - San Mateo from

Loc 68106
 Coracoid left, inc. head + int. ext. part stemal end
 Scapula, left
 prox. end only
 UCMF 95119

Loc 68106
 UCMF 68145

① is size of both P. leg + met.
 Humerus resembles Praumaucalla as distinguished from Maucalla

- ① absence of papilla above int. condyle
- ② ~~P. lat~~ wide open cuneiform head + bicip surface (capitulum groove wide open)
- ③ ~~depth through deltoid crest~~ deltoid crest not prominent + developed
 10.4 depth through deltoid, 10.0 depth sh.
 10.1 " " " " 9.6 " " same meas. P. westmorei

④ line from head distally, separates cap. groove from lig. furrow
 diagonal (sloping slightly anteriorly). Result in lig. furrow
 being ~~thrust~~ encroaching further ~~into~~ toward int. tub.

Resembles P. westmorei rather than Lagomys in ^{① greater}
 protrusion of ectepicond process from shaft + ^{② more ext. placement.}

- ③ groove bet. process + shaft more constricted
- ④ Shaft br. 5.2, depth 9.8) 54% of depth (in lag 5.1 x 7.7 = 66%)
 Dist br. cannot be meas.
 Length to intercondylar sulcus (within cond completely distally) 80.8
 max. max. 83.4
 P. lat. 81.1

① dist. met. lat. ?
 82.7

④ The tarsus & tibia agree with the ulna & carpus of 10728
 larger than any Mauicalla similar elements.
 The tarsus is distinguished from that of Mauicalla by
 less prominent ^{an} ant. protrusion of the shaft past the metatarsal

3.

The shaft of the tibia is flat, ^{an} tending to broad apertion
 toward the attach. for fibula. In Mauicalla the shaft is
 distinctly ^{longitudinally} raised below the ext. cremal crest.
 Distally the budge is missing as in M. deginensis (It is
 here ^{found to be} complete in M. Milleri)

Tibia	metatarsal	max dial U.C.M.P.	condyl. cond.	
10728		460.15		
Depth dist	12.1	9.7		
Length A	105.1	98.5	83.5	87.5 est.
B. shaft	7.9 x 4.9	6.9 x 4.1	?	6.9 x 4.4
B. dist	13.3	10.7	9.5	
B. thumb piece	9.4	8.8	?	8.1
Depth dist	12.05	9.9 (?)		
Length rel to →		107.90	126.2%	120.2%
chond. dist.	8.3	6.8		
Tarsus			42.0	
Length	47.5	43.6 (comp. 39.9)	39.2 mm	9.3
h. dist	11.4			
h. track only	8.2		10.9	9.9
B. part	12.0	10.7		
Length into carpal		40.5	?	39.3
to ext. track	45.55	(comp. 41.8)		
Length metatarsal		108.6%	113.0%	114.2% ext
rel to →				

- (2) ~~Carfometacanthus~~ is paratype of P. lag. and
 In P. lag. Carfometacanthus is paratype, in P. wet. a
 carfometacanthus is referred.

The carfometacanthus 10728 assoc with ulna, tibia &
 tarsus (+ phal + vert) resembles P. as do fragments from
 manacilla in presence of distinct blunt peripartum.
 It resembles P. wet. rather than P. lag. in longer
 process of M1 (actually as well as relative & depth
 prox end through M1) and narrow shaft of M2.
 Also lateral surface of int trochlea is ~~more deeply~~ ^{less} ~~broadly~~
 less deeply depressed than in P. lag.

- (3) The ulna⁰³ 10728¹ is distinct from manacilla by the prominent olecranon, and
 in the position of the olecranon impression partially palmed &
 bordered palmed by heavy ridge. ~~Distally~~ The distal end
 has not been previously cited for Pranaucalla, No 10728
 is distinguished from the ulna of manacilla. Compared to manacilla
 No 10728 is more rugose distally with more ~~definitely~~ ^{definitely} ~~distinct~~

Condyle.		Manacilla may	
Length to intercotylar area	36.6 mm	32.1	wet
Br across cotylae	7.5	5.2 cedar 6.6 diaphane	7.5
Depth prox end	11.0	10.2 cedar 9.3 diaphane	11.3
Pr. x depth mid sh	4.4 x 6.6	→	→ 4.2 x 6.2
Dist depth ext	8.1	→	→
Br across condyle	5.5	→	→
Pr. br. dist	8.6	8.5 #2064)	→

105) 1350
107
280
210
140

See meas on separate sheet

Tibio-tarsus 107028 is not only larger than ⁱⁿ any ¹ described species of *Mauicalla* (~~106% longer than maximum *M. diegus*~~
~~116% longer than average *M. diegus*~~)

Compared to *M. diegus*, the largest of the ^{recorded} species of *Mauicalla* it is 106% longer than the max specimen, 116% longer than the average for

The anterior face of the shaft below the proximal end is flatter than in *Mauicalla*, ~~and~~ with a broad, shallow longitudinal depression ~~surrounding the~~ adjacent to the fibular crest. ~~The shaft in *Mauicalla* the shaft is convex, especially so in *M. diegus* where there is a~~ ^{in which} ~~prominent~~ ^{with a} longitudinal ridge in the center of the shaft. The ridge is ~~less~~ ^{less} ~~prominent~~ ^{prominent} in *M. calif.*, *M. mediana* in the other spp.

The distal ~~breadth~~ ^{has a greater} end ~~flatter~~ than in *Mauicalla* (br. rel. to length 12.6% in Prae., 9.9% ¹ *M. diegus*, 11.2% in type cedar, 10.2% in dist. end not known in calif.

Tarsometatarsus 107028, like the tibia is markedly larger than any recorded specimen of ^{this element of} *Mauicalla* 108.6% of max deep, 119% of aver deep, 121% of aver cedar. ♂

Qualitatively the Prae. bone is distinguished from *Mauicalla* by ~~broaden, flatter and less~~ ^{deep} ~~deep~~ ^{area} and length, the distal foramen is ~~set in~~ ^{more} prox in position & set is a shallower groove. ~~The~~ central portion of the ant surface immediately above the middle tubercle is broader & flatter.

The foramen in *Mauicalla* lies in a ~~deep~~ ^{deep} groove, ~~the~~ the groove is only a shallow depression in this Prae. resulting in less prominence of the shaft above the mid track,

Dist. end more broadly evenly rounded due to less sharply defined groove &

Maucaallia

VCMP Scafula 95119 from San Mateo fm. V68145
 g. br. prox end 13.9
 rough br. sh 6.8 x 3.3
 Largest Maucaallia 13.0
 LACM 2176 6.9 x 2.8

Talsonetabularia LACM 107028 - Length 47.3
 length not including tub. 47.0

g. br. prox 12.1
 least " " 11.8
 g. br. dist 11.65
 least br. dist 8.3
 LACM 107028

VCMP 40015
 M. diguana 98.5 #1970
 Cedros 83.9

M. diguana 10.7
 Cedros 9.5

Length to brachial
 prox articula.
 Bi. Condyles ant. 13.5
 Depth dist. 12.15
 " ext cond 12.0
 " int cond 12.5
 Bi shaft mid 7.3
 depth " " 4.6

(2 track) Largest from VCMP 46015 - 98.5
 Specimen # ?
 LACM 2125 = 92.5
 dist 9.7
 depth int. 10.1
 depth ext. cond. 10.0
 Miller 2294 = 91.4
 LACM 2125 = 92.5
 dist 9.7
 depth int. 10.1
 depth ext. cond. 10.0
 Miller 2294 = 6.0
 LACM 2125 = 7.4
 Miller 2209 = 3.7
 LACM 2125 = 5.0

Talsonetabularia
 Length 47.3 (or 47.0 minus tub.) San Diego max 43.6, Cedros 42.0 max
 Prox br 12.1 " " " 10.7 " " 10.9 max
 dist br 11.65 " " " (Miller 2220) 8.3 " " 9.3 max
 Length sh 6.1 LACM 107028 8.8
 San del Mar 9.0

Pinguicula
 Length 30.5 (track)
 Prox br 13.1
 Dist br 13.1
 dist 2 track 10.0
 Bi. sh 7.0

Taurus Draft above middle less, raised than in Maucaalla
 with less depression adjacent externally (ant-face)
 Track 1 less raised above dist end 5.5 to bottom of track (br of 11.8)
 14.0 to top " "
 Maucaalla raised above dist end 5.1 for br. of 8.8 to bottom of track I

to top of track I 11.8
 L. 7 mm
 g. 5 mm
 HT track 76.1
 bottom of track 57.9
 top of track 134.9
 Maucaalla 72.0
 Pinguicula 46.6
 118.6

UCMP

Scapula 95119 resembles Maucalla but is flatter, with less depression of the ventral surface & a relative longer, but less prominent acromion. ~~Only the flatness can be compared with~~

~~Praemaucalla~~ Only one specimen of this element is known

for Praemaucalla - LACM 15294 from Loc LACM 1945

assigned to P. laguneus. This specimen, too, shows the greater flatness of the ventral surface. The acromion ^{adjacent to shaft} however, is incomplete. ^{Both glenoid & acromion} Facet ^{entirely} flatness less prominent than in Maucalla

95119 measures 13.8 mm in br contrasted with 12.5 for

P. laguneus 5, ~~14.4~~ ^(sh. 7.7) for the largest specimen of ~~Maucalla~~
& M. diegeni ^{sh. 8.2} (15410 Cedar 14.1, sh. 7.4)
^{depth max 3.7 (15410, 4.4)}

Coracoid LACM 107030 agrees with Praemaucalla in distinction from Maucalla in broad, relatively flat coracohumeral surface (curved & twisted posteriorly in Maucalla). This canal facing more directly internally (not twisted postly as in Maucalla).

Repetto Los Angeles -- Type of Mancalla californiensis

Repetto, Orange Co. -- referred elements of M. californiensis

San Diego Formation, San Diego -- Type Mancalla diegense and M milleri

Mission Viejo, Orange County -- referred elements of M. diegense and
Locs. 3184(CrownVal.Pkwy M. milleri

Locality 1945, Leisure World -- ~~XX~~
Monterey Formation ~~XXXXXXXXXXXXXXXXXXXX~~
Type Praemancalla lagunensis

Localities 65120,*65121 and 3183, Leisure WORLD -- M. diegense and
(*includes large radius sp?) M. milleri
check large tarso. 32364

Localities 6901, 6902, 6906 and 3185 and 7136, Orange County --
6906 Type locality Praemancalla wetmorei
6902, 3185 referred elements P. wetmorei

Loc. 1729, Corona Del Mar -- Coracoid 51925= Mancalla, can't tell whether
M. californiensis or M. diegense

Loc. 3221, El Toro Materials ColQuarry, Oso member, Capistrano Fm.--
large, incomplete coracoid, Mancalla? n.sp?
Pne?

Loc. 65144, 45, 46, 47, 48, 49, 50, 51, 52, 53 and 54 ~~XXXXXXXXXXXXXXXXXXXX~~
on Cedros Island, Baja Calif. M. cedrosensis.
Type from Loc. 65147

DISCUSSION

Since the tibiotarsus and tarsometatarsus were found closely associated with the ulna and carpometacarpus which clearly conform to the characters of Praemancalla, there seems no reason to doubt their assignment to Praemancalla, although the close resemblance of the wing elements to those described for Praemancalla wetmorei also suggest assignment to that species. The separate fragment of coracoid, though resembling Praemancalla does not conform to either P. wetmorei or P. lagunensis. Although it is more like these species than any species of Mancalla.

all returned April 19, 1979

22 March 1979

Museum property to be checked out by Gretchen Sibley for Dr. Hildegard Howard.
Compiled by Robert McKenzie.

Mancalla from Oceanside locality 4301:

- 119165 - left humerus
- 119166 - partial right humerus
- 119167 - distal right humerus
- 119168 - distal left humerus
- 119169 - distal left humerus
- 119170 - humerus shaft
- 119171 - proximal left humerus
- 119172 - left scapula
- 119173 - distal left tibiotarsus
- 119174 - shaft of left tarsometatarsus

Mancalla form San Diego

- 104279 - left humerus
- 2304 - right humerus
- 2178 - tarsometatarsus

Mancalla from Newport

- 2577 - distal humerus

Premancalla form Oceanside

- 107028 - tarsometatarsus
- 107029 - humerus

Material on loan from Museum

Since Oct 1978

Uria a. calif. Bi 480 = (87281) complete box
 " " " Bi 507 = (87284) " "
 " " " Bi 485 = (?) coracoid, ulna, radius, carpometacarpals only
 " lom via Bi 1855 (89983) Brodhub #18891 (mus. exchange)
 Uria sp (fossil) LACM 52018 prox humerus loc 6902 (published)
 UCMP specimen from Oceauside, UCMP 88704
 Uria n. sp. 1 1/2 ulnae, scapula, 2 half coracoids, 2 dist radius

Maucaella diegenae tarsometatarsus LACM 2178 (Loc 1071)
 " " humerus LACM 2304 (Loc 1080)
 " milleri humerus LACM 104279 (Loc 1080)
 " californensis dist. humerus LACM 2577 (Loc 1067)
 " " humerus LACM 107029 (Loc 4298 - Oceauside)
 Praemaucella humerus LACM 107028 (Loc 4297)
 Praemaucella tarsometatarsus LACM 15347 (Loc 65145 - Baja)
 Maucaella cedroensis humerus " 15373 " 65147 - "
 " " coracoid " 2067 (" 1071 San Diego)
 " diegenae coracoid

Maucaella from Oceauside Loc. 4301

Nos. 119145-119144 collected 1979 (few)

Nos. 119222, 119223, 119224 " 1977 (earliest than 79) (3)

7 humeri Complete elements, 2 dist. half humeri, 2 dist. end humeri, 1 shaft ? humeri, 1 prox scapula
 1 dist tarsometatarsus, 1 tarsometatarsus, 1 prox scapula
 2 prox humeri, 1 w/ coracoid (119222-119224)
 119223

Ret'd 4.19.79

Ret'd 4.19.79

Ret'd to Museum

(SDNHM)

However, Robert Chandler of the San Diego Natural History Museum
has called my attention to a small tarasumetatus²²⁹¹⁶ in the SDNHM
collection from the San Diego Formation on Washington St
in S.D. which he refers (Chandler ms) to *Q. howardae*.

The specimen is apparently 14% shorter than the minimum of the series
in Recent *Q. stellata*.

The specimen bears the same size relationship to Recent
specimens of *Q. stellata* as previously observed (Amos 1958)
p. 5 for one of the series referred to *Q. howardae*.

68.6

Q. palaeodytes from the Early Pleistocene Hemphillian correlation
Bone Valley Formation; *Q. concinna* from the Elchegoin Formation,
of Calif. with referred material from the Bone Valley Formation
and the Late Pleistocene San Diego Formation of Calif. and *Q. howardae*
from the S.D. Formation

68.6 - ~~tarasumetatus~~ ^{fossil}

stellata 70-72.2
min 81.7-91.3
par 66.9-75.8

80
54
26

81 + 2 = 83
54
29

San Mateo Lounation

Paimauncallo

This was later
rewritten to include
all materials from "San Mateo fm"
both lower & upper beds.

1600 words
plus tables
+ figures
+ 150 word
lit cited

PRAEMANCALLA FROM SAN DIEGO COUNTY, CALIFORNIA¹

(ALCIDAE: MANCALLINAE)

By Hildegarde Howard²

Abstract: Mancalline leg bones found in association with wing elements assignable to Praemancalla wetmorei Howard 1976 are the first to be recorded for the genus. The occurrence ^{of Praemancalla} in the lower section of deposits in Lawrence Canyon, near Oceanside assigned to the San Mateo Formation suggest correlation with the upper part of the Monterey Formation rather than with the Capistrano or Almejas Formation in which Mancalla is the dominant avian genus.

INTRODUCTION

The subfamily Mancallinae is best known for the genus Mancalla Lucas 1901, a flightless auk with wing bones modified as swimming paddles. Mancalla is abundantly represented in Pliocene deposits in southern California and Baja California. All major skeletal elements are known. Four species have been described: Mancalla californiensis Lucas 1901, M. diegense (Miller 1937), M. milleri Howard 1970 and M. cedrosensis Howard 1971.

Praemancalla Howard 1966, so named because of obvious similarities to Mancalla, though with wing bones less highly modified for swimming, is recorded from two sites in the Late Miocene, Monterey Formation of Orange County, California. Two species are represented, P. lagunensis Howard 1966 and P.

wetmorei Howard 1976. The former is from a slightly earlier facies of the Monterey Formation than is P. wetmorei. Only wing and shoulder girdle bones (with one fragment of mandible) have been identified for Praemancalla.

During 1975 excavations by the Natural History Museum of Los Angeles County (LACM) near Oceanside, San Diego County, California, bones were recovered at LACM localities 4297 and 4298 on Loretta Street in Lawrence Canyon, from white sands near the bottom of a stratigraphic section presumably referable to the San Mateo Formation. Included are bones of Praemancalla.

In the same area, sands and conglomerates stratigraphically above LACM locality 4297 contain a Blancan, Late Pliocene fauna, including bones of Mancalla.

MATERIAL

Associated skeletal elements of Praemancalla were recovered at LACM locality 4297. Catalogued as LACM 107028 these include left carpometacarpus, left ulna, right tibiotarsus, left tarsometatarsus, left phalanx 1 digit 2 and thoracic vertebra no. 3. Als from LACM locality 4297, though not associated with LACM 107028, is a poorly preserved scapular end of left coracoid, LACM 107030. A right humerus of Praemancalla (LACM 107029), abraded distally and in the area of the internal tuberosity, was recovered from LACM locality 4298, across the road from LACM locality 4297.

All previously recorded specimens of Praemancalla (from the Orange County localities), as well as abundant comparative material of all four species of Mancalla, were available for study in the LACM collections.

Handwritten: 42297
 A Description -- In the partial skeleton LACM 107028, the carpometacarpus

ANALYSIS

Carpometacarpus LACM 107028. -- Resembling this element in Praemancalla as distinguished from that of Mancalla in presence of distinct, blunt pisiform process and more flared internal trochlear crest, and resembling Praemancalla wetmorei (LACM 52216) as distinguished from paratype of P. lagunensis (LACM 15287) in greater proximal extension of trochlear crest above metacarpal I (M1), longer process of M1 (proximo-distally), and less deeply depressed internal surface above pisiform process. Distally distinguished from carpometacarpi of Mancalla by more posteriorly extended distal surface of M2 toward M3, resulting in limited extent of groove between M2 and M3 distally. The distal end is lacking in the specimens of carpometacarpus of both P. wetmorei and P. lagunensis. However, the contours of the referred specimen of P. wetmorei as compared to LACM 107028 suggest that only 1 mm is lacking, and that the bone was approximately equal in length to LACM 107028.

Ulna LACM 107028. -- Resembling paratype of Praemancalla wetmorei (LACM 32429) as distinguished from ulnae of Mancalla in prominent olecranon set off from cotylae by deep groove externally and depression internally (though in paratype depression is deeper and more pit-like); brachial impression partially palmar and bordered palmar by heavy, long ridge; radial depression broad. Distally distinguished from specimens of Mancalla by greatly enlarged projection overhanging tendinal pit externally, and a deep groove separating carpal tuberosity from trochlea internally. The distal end is lacking in the paratype of P. wetmorei, but the length of LACM 107028 (36.7 mm) conforms well with the length

of the previously referred radius of P. wetmorei, LACM 53907 (35.8 mm). Neither ulna nor radius is known for P. lagunensis.

^{The} Tibiotarsus LACM 107028.-- Similar to this element in Mancalla in general shape and curvature, being relatively broader and flatter of shaft than in members of the subfamily Alcinae such as Uria Brisson 1760 and Pinguinis Bonnaterra 1790. Distinguished from tibiotarsi of Mancalla by broader shaft, ^{which is} less convex anteriorly below cnemial crests; ^{and} relatively longer cnemial crests; distal end more markedly flared. The tibiotarsus was not heretofore recorded for Praemancalla.

^{The} Tarsometatarsus LACM 107028.-- Similar to that of Mancalla in general shape, with anterior surface of shaft depressed and bordered externally by ridge. Distinguished from tarsometatarsi of Mancalla by shaft narrowing more abruptly distal to center, anterior face of shaft above trochleae more broadly and evenly rounded, ^{and} lacking ^{the} acutely raised area proximal to middle trochlea; distal foramen more proximal in position and set in shallower groove; ^{and} internal trochlea less raised above distal end. The tarsometatarsus was not heretofore recorded for Praemancalla.

^{The Pedal Phalanx} Phalanx 1, digit 2 (pedal) LACM 107028.-- ^{Conforming} in general characters to this element in recent alcines such as Uria, but ^{is} markedly larger: length 19.1 mm, proximal breadth 5.7 mm, distal breadth 3.4 mm. The specimen articulates suitably with the internal trochlea of the tarsometatarsus of LACM 107028. This element has not been ^{previously} noted for Mancalla or Praemancalla.

Thoracic vertebra no. 3 LACM 107028.-- Only one thoracic no. 3 of Mancalla (LACM 15425, M. cedrosensis) is sufficiently well preserved for comparison. LACM 107028 resembles LACM 15425

of the radius previously referred

as distinguished from specimens of this element ~~in~~ Uria in longer rib attachment and straighter ventral border of posterior articular surface of centrum, and is distinguished from both LACM 15425 and specimens of Uria in greater height of anterior articular surface of centrum at center, narrowing laterally. The dorsal area is broken ~~on~~ LACM 15425. Compared with this area in Uria, ^{the} postzygapophyses of LACM 107028 are more flared, and ^{the} neural spine seemingly more posterior in position (spine broken in fossil). Greatest length of vertebra LACM 107028, 18.0 mm, length of centrum 11.9 mm, least dorsal breadth 6.4 mm. Same dimensions in Uria LACM Bi494, 15.0 mm, ^{10.2} ~~4.02~~ mm and 4.2 mm. Only breadth of anterior and posterior surfaces of centrum can be compared with M. cedrosensis: breadth anterior surface 8.3 mm (7.3 in M. cedrosensis, 5.7 in Uria); breadth posterior surface 6.5 mm (4.9 mm in M. cedrosensis, 4.3 in Uria).

^{Insert vent 10248 center}
^{separate LACM 107030 from LACM 4298}
Coracoid LACM 107030.-- Similar to ^{this element} coracoid of Praemancalla as distinguished from that of Mancalla in more medially, less posteriorly oriented triosseal canal; and ^{the} broad, flat coracohumeral attachment, not twisted anteriorly. Characters that distinguish P. wetmorei from P. lagunensis are not observable in this poorly preserved fragment.

^{hum. LACM 4298}
Humerus LACM 107029.-- Resembling ^{the} holotype of Praemancalla wetmorei as distinguished from humeri of Mancalla in poorly developed deltoid crest. Resembling both P. wetmorei and P. lagunensis holotypes in absence of papilla proximal to internal distal condyle. The humerus of P. lagunensis lacks the proximal end. Breadth relative to depth of shaft above distal end ^{53%} as in P. wetmorei (66% in P. lagunensis). Imperfections of preservation make further comparison impossible.

^{add scapula}

6

~~CONCLUSIONS~~

Discussion -

^ Associated elements (LACM 107028) assigned to Praemancalla on the basis of the carpometacarpus and ulna, provide the first information regarding the tibiotarsus and tarsometatarsus for this genus. Details of the distal end of the ulna and carpometacarpus are also provided, and a thoracic vertebra and pedal phalanx are added to the list of elements now assigned to Praemancalla, though they ^{contribute} add little to its description.

Assignment of specimen LACM 107028 to Praemancalla wetmorei is considered valid in view of the resemblance of the proximal portions of the wing elements to specimens from the Monterey Formation assigned to that species. The poorly preserved coracoid (LACM 107030) ⁹⁵¹¹⁹ and humerus (LACM 107029) ^{Scapula and axo vertebra 102428} are tentatively so assigned.

As was suggested in the original study of P. wetmorei (Howard 1976), the specimens now at hand from Oceanside indicate that this species was generally larger than any mancalline species previously described. The proportions of one element to another, however, may vary. Within the genus Mancalla, for example, the coracoid of the type skeleton of M. cedrosensis (LACM 15373) is 4.3 mm shorter than the minimum recorded for M. diegense, whereas all the other elements of the type skeleton are well within the size range of M. diegense. In M. californiensis the carpometacarpus is longer and more slender than in any other mancalline species (6.1 mm longer than the maximum for M. diegense), yet other measurable elements do not deviate markedly from those of M. diegense in length.

Except for the carpometacarpus, maximum sized elements of Mancalla diegense are the largest so far described for the genus

Mancalla. Storrs Olson (in litt.), however, has recovered an ulna, assignable to Mancalla, which exceeds those of M. diegense, and is .5 mm longer than the ulna of LACM 107028 here assigned to Praemancalla wetmorei. Contrasted with the maximum for comparable elements of M. diegense, the carpometacarpus of LACM 107028 is 3% shorter, the ulna 14% longer, the tibiotarsus 7% longer and the tarsometatarsus 8% longer. In all LACM 107028 elements, breadths exceed the maximums for M. diegense. See Table 1

5x final conclusion of what nature
 The occurrence of Praemancalla in the lowest levels of the Lawrence Canyon deposits, which have been assigned to the San Mateo Formation by Barnes (1976:331) raises a question regarding the age correlations of these beds with other marine formations along the west coast. According to Barnes (op. cit.) the section at Oceanside is correlated with the Capistrano Formation of Orange County and the Almejas Formation of Cedros Island, Baja California, and less directly with the Repettian foraminiferal stage. The avifauna from the Almejas Formation has been studied in detail (Howard, 1971). Mancalla is the dominant form. Likewise at LACM locality 1067 in Corona del Mar, Orange County, California, where bird bones were found in association with Repettian foraminifera (Howard, 1949) and the Capistrano Formation at LACM localities 65120 and 65121 in Laguna Hills, Orange County (Howard 1968 and 1970), Mancalla is the predominant genus of the avifauna. Praemancalla is recorded only in the Monterey Formation of California.

In view of the occurrence of Praemancalla at LACM locality 4297 and 4298, it is suggested that these localities in the lower part of the stratigraphic section at Oceanside are more closely

correlated with the upper part of the Monterey Formation than with either the Capistrano or Almejas Formations.

ACKNOWLEDGMENTS

I am continually grateful to the Vertebrate Paleontology staff of the Natural History Museum of Los Angeles County for the opportunity to study material in the collections of that department and for their many kindnesses. Particular thanks are extended to Robert Mackenzie, who collected the associated elements at LACM Locality 4297 for description of the occurrence, and to Dr. Lawrence Barnes for discussions concerning stratigraphic correlations.

The photographs were made by

The figures were prepared by

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- Howard, H. 1966. A possible ancestor of the Lucas Auk (Family Mancallidae) from the Tertiary of Orange County, California. Los Angeles Co. Mus. Contrib. Sci. No. 101:1-8.
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TABLE 1

Measurements (in millimeters) of Oceanside Bones Compared
With Praemancalla and Maximum of Mancalla diegense

	Oceanside	<u>Praemancalla</u> <u>wetmorei</u>	<u>lagunensis</u>	<u>Mancalla</u> <u>diegense</u>
Carpometacarpus				
Length	36.3	36.3 est.		37.2
Proximal depth	11.8	12.1	11.7	11.0
Height process metacarpal 1	15.2	15.7	14.0	15.5
Breadth shaft	4.0	4.0	4.5	3.7
Ulna				
Length to inter- cotylar ridge	36.7	...	...	32.0
Proximal breadth	7.5	7.5	...	6.6
Proximal depth	11.0	11.3	...	9.3
Breadth shaft (mid)	4.4	4.2	...	3.9
Depth shaft (mid)	7.0	6.2	...	6.8
Humerus				
Length to inter- condylar sulcus	81.0	81.0	...	83.4
Proximal breadth	20.5ap.	22.2	...	20.3
Shaft breadth	5.2	5.1	5.1	5.2
Depth shaft	9.8	9.6	7.7	10.3
Tibiotarsus				
Length(excluding crests)	105.1	...	111.1	98.5
Distal breadth	13.5	...	...	110.7
Distal depth	12.1	...	...	9.7
Tarsometatarsus				
Length	47.5	...	...	43.6
Proximal breadth	12.1	...	...	10.7
Distal breadth	11.6	...	...	9.4
Shaft breadth (mid)	6.1	...	...	5.4

Footnotes, page 1

¹Review Committee

Lawrence G. Barnes

Storrs L. Olson

Stuart Warter

²Chief Curator Emeritus, Natural History Museum of Los Angeles

County, 900 Exposition Boulevard, Los Angeles, California 90007

Figures to include:

Carpometacarpus LACM 107028, internal view

Ulna LACM 107028, palmar view, internal view, external view

Tibiotarsus LACM 107028, anterior view, external view, posterior view

Tarsometatarsus LACM 107028, anterior view, posterior view

Specimen LACM 107028, assigned to the genus Præmanicalla on the basis of the two wing bones, provides the first information regarding the tibiotarsus and tarsometatarsus for this genus. Details of the distal end of the ulna and carpometacarpus are also provided, and a thoracic vertebra and pedal phalanx are

CONCLUSIONS

CONCLUSIONS

Associated elements (LACM 107028) assigned to the genus Praemancalla on the basis of the carpometacarpus and ulna, provide the first information regarding the tibiotarsus and tarso-metatarsus for this genus.

Since it appears that your
collaborators will not finish anything on
the San Mateo fossils soon, you may
wish to expand this to include all
the birds, or at least the other
birds associated with Praemancalla
in the lower white sands. If so,
more geological discussion is needed.
I could help you on this

harry

1600 words
plus 150 word
lit. cited plus
table & figures.

PRAEMANCALLA FROM SAN DIEGO COUNTY, CALIFORNIA¹

(ALCIDAE: MANCALLINAE)

Aves:

By Hildegarde Howard²

A fossil partial bird skeleton
Abstract: ~~Mancalline leg bones found in association~~

includes leg bones
with wing elements assignable to Praemancalla wetmorei

part of the stratigraphic
Howard 1976 are the first to be recorded for the genus Praemancalla
of Praemancalla

in rocks previously
The occurrence in the lower section of deposits in

temporal of that part of the section
Lawrence Canyon, near Oceanside assigned to the San

younger
Mateo Formation suggests correlation with the upper part

of the Monterey Formation rather than with the Capistrano

or Almejas Formations in which Mancalla is the dominant

avian genus.

extinct alcid
INTRODUCTION

a sentence about auks
The subfamily Mancallinae is best known for the genus,
Mancalla Lucas 1901, a flightless auk *whose* with wing bones *were* modified
as swimming paddles. Mancalla *fossil bones of are* is abundantly represented in

Pliocene deposits in southern California and Baja California.

the
All major skeletal elements are known. Four species have been *previously*
described: Mancalla californiensis Lucas 1901, M. diegense
(Miller 1937), M. milleri Howard 1970 and M. cedrosensis Howard
1971.

The geologically older
Praemancalla Howard 1966, *was* so named because of obvious
similarities to Mancalla, though with wing bones less highly
modified for swimming. *It has been* is recorded from two sites in the Late
Miocene, Monterey Formation *in* of Orange County, California. Two
species are represented, P. lagunensis Howard 1966 and P.

*a third genus, Alcedo Howard 1968 was assigned to this subfamily with Alcedo being
stated that "Alcedo is a collateral rather than a direct line with respect to Praemancalla & Mancalla"
in character. It is known only from Laramie Co. 1948,*

wetmorei Howard 1976. The former ^{species} is from a slightly earlier, ^{and stratigraphically} lower facies of the Monterey Formation than is P. wetmorei. Only wing and shoulder girdle bones (with one fragment of mandible) have been identified for ^{species of} Praemancalla.

During 1975, excavations by the Natural History Museum of Los Angeles County (LACM) near Oceanside, San Diego County, California, ^{yielded fossil} bones were recovered at LACM localities 4297 and 4298 on Loretta Street in Lawrence Canyon, from ^{white sands} near the bottom of a stratigraphic section presumably referable to the San Mateo Formation. ^(Barnes, 1976) Included ^{are} ^{bones of} Praemancalla, ^{red} ^{found in} ^{visibly} ^{assemblages,}

In the same area, sands and conglomerates stratigraphically above LACM locality 4297 contain a ^{younger, apparently} ^{correlative} ^{assemblages,} Blancan, Late Pliocene fauna, including bones of Mancalla.

SYSTEMATIC PALEONTOLOGY

Referred MATERIAL

Associated skeletal elements of Praemancalla were ^{collected} ^{by Robert M. McKemie, and Lawrence G. Barnes, (date)} recovered at LACM locality 4297. Catalogued as LACM 107028, these include left carpometacarpus, left ulna, right tibiotarsus, left tarso-pedal metatarsus, left ^{phalanx} 1 digit 2 and thoracic vertebra no. 3. Also from LACM locality 4297, though not associated with LACM 107028, is a poorly preserved scapular end of ^{collected by} ^{date} left coracoid, LACM 107030. A right humerus of Praemancalla (LACM 107029), ^{collected by Michael K. Hammer, (date)} abraded distally and in the area of the internal tuberosity, was recovered from LACM locality 4298, across the road from LACM locality 4297.

All previously recorded specimens of Praemancalla (from the Orange County localities), as well as abundant comparative material of all four species of Mancalla, were available for study in the LACM collections.

Osteology
ANALYSIS

3 { Subheading under
Syst. Palaeo.

Carpometacarpus LACM 107028.-- Resembling this element in Praemancalla^{spp.} as distinguished from that of Mancalla^{spp.} in presence of distinct, blunt pisiform process and more flared internal trochlear crest; ~~and~~ resembling Praemancalla wetmorei (LACM 52216) as distinguished from paratype of P. lagunensis (LACM 15287) in greater proximal extension of trochlear crest above^{the first} metacarpal^{spp.} (M1), longer process of M1 (proximo-distally), and less deeply depressed internal surface above pisiform process. Distally distinguished from carpometacarpi of Mancalla^{spp.} by more posteriorly extended distal surface of M2 toward M3, resulting in limited extent of groove between M2 and M3 distally. The distal end is lacking in the specimens of carpometacarpus of both P. wetmorei and P. lagunensis. However, the contours of the referred specimen of P. wetmorei as compared to LACM 107028 suggest that only 1 mm is lacking, and that the bone was approximately equal in length to LACM 107028.

Ulna LACM 107028.-- Resembling paratype of Praemancalla wetmorei (LACM 32429) as distinguished from ulnae of Mancalla^{spp.} in prominent olecranon set off from cotylae by deep groove externally and depression internally (though in paratype depression is deeper and more pit-like); brachial impression partially palmar and bordered palmar by heavy, long ridge; radial depression broad. Distally distinguished from specimens of Mancalla by greatly enlarged projection overhanging tendinal pit externally, and deep groove separating carpal tuberosity from trochlea internally. The distal end is lacking in the paratype of P. wetmorei, but the length of LACM 107028 (36.7 mm) conforms well with the length

For style I recommend names of bones as left margin subheadings, with text non-telegraphic, and perhaps refer to catalogue nos. In text, not subheadings since they were given in the previous subsection.

} for clarity with
first time use, with
abbreviation.

of the previously referred radius of P. wetmorei, LACM 53907 (35.8 mm). Neither ulna nor radius is known for P. lagunensis.

Tibiotarsus LACM 107028.--Similar to this element in Mancalla in general shape and curvature, being relatively broader and flatter of shaft than in members of the subfamily Alcinae such as Uria Brisson 1760 and Pinguinis Bonnaterra 1790. Distinguished from tibiotarsi of Mancalla by broader shaft, less convex anteriorly below cnemial crests; ; relatively longer cnemial crests; distal end more markedly flared. The tibiotarsus was not heretofore recorded for Praemancalla.

Tarsometatarsus LACM 107028.-- Similar to that of Mancalla in general shape, with anterior surface of shaft depressed and bordered externally by ridge. Distinguished from tarsometatarsi of Mancalla by shaft narrowing more abruptly distal to center, anterior face of shaft above trochleae more broadly and evenly rounded, lacking acutely raised area proximal to middle trochlea; distal foramen more proximal in position and set in shallower groove; internal trochlea less raised above distal end. The tarsometatarsus was not heretofore recorded for Praemancalla.

Phalanx 1, digit 2 (pedal) LACM 107028.-- Conforming in general characters to this element in recent alcines such as Uria, but markedly larger: length 19.1 mm, proximal breadth 5.7 mm, distal breadth 3.4 mm. The specimen articulates suitably with the internal trochlea of the tarsometatarsus of LACM 107028. This element has not been ^{previously discovered} noted for Mancalla or Praemancalla.

Thoracic vertebra no. 3 LACM 107028.-- Only one thoracic ^{vertebra} no. 3 of Mancalla (LACM 15425, M. cedrosensis) is sufficiently well preserved for comparison. LACM 107028 resembles LACM 15425

as distinguished from specimens of this element of Uria in longer rib attachment and straighter ventral border of posterior articular surface of centrum, and is distinguished from both LACM 15425 and specimens of Uria in greater height of anterior articular surface of centrum at center, narrowing laterally. The dorsal area is broken in LACM 15425. Compared with this area in Uria, postzygapophyses of LACM 107028 are more flared, and neural spine seemingly more posterior in position (spine broken in fossil). Greatest length of vertebra LACM 107028, 18.0 mm, length of centrum 11.9 mm, least dorsal breadth 6.4 mm. Same dimensions in Uria LACM Bi494, 15.0 mm, 10.2 mm and 4.2 mm. Only breadth of anterior and posterior surfaces of centrum can be compared with M. cedrosensis: breadth anterior surface 8.3 mm (7.3 in M. cedrosensis, 5.7 in Uria); breadth posterior surface 6.5 mm (4.9 mm in M. cedrosensis, 4.3 in Uria).

Coracoid LACM 107030.-- Similar to coracoids of Praemancalla spp. as distinguished from ^{those} ~~that~~ of Mancalla ^{spp.} in more medially, less posteriorly oriented triosseal canal; and broad, flat coracohumeral attachment, not twisted anteriorly. Characters that distinguish P. wetmorei from P. lagunensis are not observable in this poorly preserved fragment.

Humerus LACM 107029.-- Resembling holotype of Praemancalla wetmorei as distinguished from humeri of Mancalla in poorly developed deltoid crest. Resembling both P. wetmorei and P. lagunensis holotypes in absence of papilla proximal to internal distal condyle. The humerus of P. lagunensis lacks the proximal end. Breadth relative to depth of shaft above distal end 53% as in P. wetmorei (66% in P. lagunensis). Imperfections of preservation make further comparison impossible.

CONCLUSIONS

Associated ^{fossil bones} elements (LACM 107028) assigned to Praemancalla on the basis of the carpometacarpus and ulna, provide the first information regarding the tibiotarsus and tarsometatarsus for this genus. ^{The same specimen^{als} reveals} Details of the distal end of the ulna and carpometacarpus, ^{are also} provided, and a thoracic vertebra and pedal phalanx are added to the list of elements now assigned to Praemancalla, though they add little to its description.

Assignment of ^{the partial skeleton} specimen LACM 107028, to Praemancalla wetmorei is considered valid in view of the resemblance of the proximal portions of the wing elements to specimens from the Monterey Formation assigned to that species. The poorly preserved coracoid (LACM 107030) and humerus (LACM 107029) are ^{also} tentatively ~~so~~ assigned ^{to} P. wetmorei.

As was suggested in the original study of P. wetmorei (Howard 1976), the specimens now at hand from Oceanside indicate that this species was generally larger than any mancalline species previously described. The proportions of one element to another, however, may vary. Within the genus Mancalla, for example, the coracoid of the type skeleton of M. cedrosensis (LACM 15373) is 4.3 mm shorter than the minimum recorded for M. diegense, whereas all the other elements of the type skeleton are well within the size range of M. diegense. In M. californiensis the carpometacarpus is longer and more slender than in any other mancalline species (6.1 mm longer than the maximum for M. diegense), yet other measurable elements do not deviate markedly from those of M. diegense in length.

Except for the carpometacarpus, maximum ^{size} sized elements of Mancalla diegense are the largest so far described for the genus

Mancalla. Storrs Olson (in litt.), however, has recovered an ulna, assignable to Mancalla, which exceeds those of M. diegense, and is .5 mm longer than the ulna of LACM 107028 here assigned to Praemancalla wetmorei. Contrasted with the maximum for comparable elements of M. diegense, the carpometacarpus of LACM 107028 is 3% shorter, the ulna 14% longer, the tibiotarsus 7% longer and the tarsometatarsus 8% longer. In all LACM 107028 elements, breadths exceed the maximums for M. diegense. See Table 1.

The occurrence of Praemancalla in the lowest levels of the Lawrence Canyon deposits, which have been assigned to the San Mateo Formation by Barnes (1976:331) raises a question regarding the ^{previously-made} age correlations of these beds with other marine formations along the west coast. According to Barnes (op. cit.) the section at Oceanside is ^{with the use of marine mammals} correlated with the Capistrano Formation of Orange County and the Almejas Formation of Cedros Island, Baja California, and less directly with the Repettian foraminiferal stage. The avifauna from the Almejas Formation has been studied in detail (Howard, 1971). Mancalla is the dominant form. Likewise at LACM locality 1067 in Corona del Mar, Orange County, California, where bird bones were found in association with Repettian foraminifera (Howard, 1949) and the Capistrano Formation at LACM localities 65120 and 65121 in Laguna Hills, Orange County (Howard 1968 and 1970), Mancalla is the predominant genus of the avifauna. Praemancalla is recorded only in the Monterey Formation of California.

In view of the occurrence of Praemancalla at LACM locality 4297 and 4298, it is suggested that ~~these localities~~ ^{is} in the lower part of the stratigraphic section at Oceanside are more closely

This section needs more discussion, particularly age + geology. These are discussed in considerably more detail in the abstract + intro, but they should be only summarized here. How about some functional interpretations of P. wetmorei + some evolutionary discussion?

correlated with the upper part of the Monterey Formation than with either the Capistrano or Almejas Formations.

ACKNOWLEDGMENTS

I am continually grateful to the Vertebrate Paleontology staff of the Natural History Museum of Los Angeles County for the opportunity to study material in the collections of that department and for their many kindnesses. Particular thanks are extended to Robert Mackenzie, who collected the associated elements at LACM Locality 4297 for description of the occurrence, and to Dr. Lawrence Barnes for discussions concerning stratigraphic correlations.

The photographs were made by

The figures were prepared by

LITERATURE CITED

(see p. 9)

The mammals and Mancalla in the upper part of the section may very well suggest correlation with the Capistrano and Almejas Formations, and possibly with the San Diego Formation, but the new evidence suggests that the relatively thin stratigraphic section at Oceanside represents a considerably greater length of time than was previously thought.

We should cite the geol. maps for

the area.

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- Barnes, L. G. 1976. Outline of eastern North Pacific fossil Cetacean assemblages. Syst. Zool. 25(4):321-343.
- Howard, H. 1966. A possible ancestor of the Lucas Auk (Family Mancallidae) from the Tertiary of Orange County, California. Los Angeles Co. Mus. Contrib. Sci. No. 101:1-8.
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TABLE 1

Measurements (in millimeters) of Oceanside Bones Compared
With Praemancalla and Maximum of Mancalla diegensis

	Oceanside	<u>Praemancalla</u> <u>wetmorei</u>	<u>lagunensis</u>	<u>Mancalla</u> <u>diegensis</u>
Carpometacarpus				
Length	36.3	36.3 est.		37.2
Proximal depth	11.8	12.1	11.7	11.0
Height process metacarpal 1	15.2	15.7	14.0	15.5
Breadth shaft	4.0	4.0	4.5	3.7
Ulna				
Length to inter- cotylar ridge	36.7	...	...	32.0
Proximal breadth	7.5	7.5	...	6.6
Proximal depth	11.0	11.3	...	9.3
Breadth shaft (mid)	4.4	4.2	...	3.9
Depth shaft (mid)	7.0	6.2	...	6.8
Humerus				
Length to inter- condylar sulcus	81.0	81.0	...	83.4
Proximal breadth	20.5ap.	22.2	...	20.3
Shaft breadth	5.2	5.1	5.1	5.2
Depth shaft	9.8	9.6	7.7	10.3
Tibiotarsus				
Length(excluding crests)	105.1	...	111.	98.5
Distal breadth	13.5	...	...	110.7
Distal depth	12.1	...	...	9.7
Tarsometatarsus				
Length	47.5	...	...	43.6
Proximal breadth	12.1	...	...	10.7
Distal breadth	11.6	...	...	9.4
Shaft breadth (mid)	6.1	...	...	5.4

Footnotes, page 1

¹Review Committee

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Figures to include:

Carpometacarpus LACM 107028, internal view

Ulna LACM 107028, palmar view, internal view, external view

Tibiotarsus LACM 107028, anterior view, external view, posterior view

Tarsometatarsus LACM 107028, anterior view, posterior view

of the radius previously referred

SECTION 103038, SUPERIOR AREA, BOSTON AREA
SECTION 103038, SUPERIOR AREA, EXETER AREA, BOSTON AREA
DUE TO 103038, SUPERIOR AREA, EXETER AREA
SECTION 103038, SUPERIOR AREA
SECTION 103038, SUPERIOR AREA

13.8 mm (P. lagunensis 12.5 mm), breadth of shaft 7.3 mm (P. lagunensis 6.2 mm). the scapula has not been previously recorded for P. wetmorei.

The axis vertebra, UCMP 102428, ^{resembles} bears resemblance to a specimen of this element from the San Diego Formation assigned to Mancalla (UCMP 45892) in the more round ^{ed less} facets of the ^{than in Mancalla} oval/postzygapophyses; they are, however, more concave than in that genus. Also, the sides of the vertebra are more deeply depressed toward the anterior end, and, in this regard, are suggestive of the condition in the Murre, Uria aalge. The large size of the Oceanside specimen is in keeping with the large leg bones ~~XXXX~~ (UCMP 107028) here assigned to Praemancalla wetmorei. Length of ^{7.6 mm in Uria aalge} centrum 12.2 mm (9.4 mm in Mancalla UCMP 45892), least dorsal breadth ^{5.5 in U. aalge} 7.1 mm (Mancalla 6.2 mm), breadth vs height of posterior centrum 3.1 x 5.5 mm (2.7 x 4.4 mm in Mancalla), 1.7 x 2.8 in U. aalge).

Genus Mancalla Lucas 1901

Mancalla sp.

In the axis vert. the facets of the pterygoid process
 are round as in a specimen of *Manicallia* (USNP 45892) ^{from the S.D. fauna and with}
 rather than oval as in *Bucania*, they are
 however more concave than in the last *Diez* specimen

in the more rounded than oval *Manicallia*; they are, however,
 more concave than in that genus. Also, the sides of the vertebrae are
 more deeply depressed toward the anterior end, and, in this regard, are
 suggestive of the condition in the genus, *Diez*. The large size of
 the *Manicallia* specimen is in keeping with the larger size of the

(USNP 45892) here assigned to *Manicallia* (length of
 1.0 mm in this series)
 centrum 1.2 mm, 0.4 mm in *Manicallia* (USNP 45892), least dorsal breadth
 0.7 in 0.5 mm
 0.1 mm *Manicallia* 0.5 mm, breadth vs height of posterior centrum 0.1 x
 0.2 mm (0.1 x 0.4 mm in *Manicallia*), 1.7 x 0.8 in 1.1 mm

Manicallia sp.
Manicallia sp.